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4 March 1986

# USSR Report

AGRICULTURE



FOREIGN BROADCAST INFORMATION SERVICE

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LIVESTOCK FEED PROCUREMENT

GREATER USE OF RAPE AS FEEDSTOCK PROMOTED .

Riga CINA in Latvian 14 Aug 85 p 2

[Article by A. Nollendoria, candidate, Biological Sciences: "Rape, Still Unfamiliar"]

[Text] In order to obtain more milk and meat, nutritious pastures and aromatic hay are not enough. The energy yield of grain is needed. Necessary as well is much else that in the end makes full-strength cattle feed. Rape has such properties, which is why it is an important crop. In the trough it mixes well with traditional feedstocks, each augmenting the other.

This autumn already agricultural workers will be learning how to sow rape so that the next harvest will be richer than in previous years. This will succeed if we take into consideration and bear in mind all of the various feedstocks, and there are many. Rape growing in the wild can be viewed as the predecessor of many crops in the field, and for this reason it is imperative to find a place for it in the crop cycle.

Only now are we beginning to implement our accumulated knowledge towards this end. Experiments in the field with this cultivated crop have already become too restricted in scope, and moreover they are conducted on kolkhozes and Soviet collective farms. In order to strengthen this trend further, we today publish the findings of experts on the cultivation and rational utilization of rape.

The successful wintering of rape requires, before the start of winter, the development of a rosette of between five and eight leaves of 30-35 centimeters in height. Plants develop better, and do not wither, if they are not sown too densely, not more than 100-120 plants per square meter; thus it is not desirable to over-seed the crop. First priority must be given to conventional row-sowing methods so as to ensure uniform seed dispersion. The frost tolerance of the plants is dependent on fertilization with phosphorous and calcium. In autumn, do no, or do very little, watering--30 kilograms per hectare. With more moisture, rape overgrows and does not winter as successfully.

Weed control in rape cultivation can be accomplished by both mechanical and chemical methods. Weed clearing on a farm where winter rape is grown, requires the application of lontrel. Applying this herbicide to the rape field in the spring will destroy dandelions and thistle as well.

Agricultural specialists should be clearly aware that successful cultivation of this crop demands strict adherence to the high quality standards of all the technologies involved, without this, one cannot achieve the high volume crop yield that would justify the invested labor and capital.

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## LIVESTOCK

## PROCUREMENT OF LIVESTOCK PRODUCTS ASSESSED, TASKS NOTED

Moscow ZAKUPKI SELSKOKHOZYAYSTVENNYKH PRODUKTOV in Russian No 12, Dec 85  
pp 1-3

[Article: "Do Not Lower Procurement Rate for Livestock Products During Winter Period"]

[Text] The year 1985, the concluding year of the 11th Five-Year Plan, is coming to an end. It has been replete with important events and significant undertakings in the life of the party and the entire Soviet people.

The draft, new edition of the CPSU Program submitted for national discussion at the October 1985 Plenum of the CPSU Central Committee stresses the fact that further strengthening of the agroindustrial complex and enhancement of its effectiveness, and complete satisfaction of the nation's needs for its output are essential for the nation's social and economic progress. The kolkozses, sovkhoses and agroindustrial associations, which comprise the foundation of socialist agriculture, are expected to make a decisive contribution toward meeting the nation's needs for farm products.

Speaking in Tselinograd on the matter of further developing the agroindustrial complex, Comrade M.S. Gorbachev, General Secretary of the CPSU Central Committee, particularly stressed the fact that the production and build-up of state meat supplies constitute the most intensive area in the fulfillment of the Food Program.

The party's highly important decisions met with the profound understanding and support of the Soviet people. An intense and selfless struggle for the successful fulfillment of plans for the production of farm products and their sale to the state was launched throughout the nation. The initiative of the advanced farms, which set themselves the task of fulfilling the first commandment on the procurement of grain, meat, milk, eggs, wool and livestock raw material, took on broad scope in all of the republics, krays, oblasts and rayons.

We can state with satisfaction today that the first years of implementation of the Food Program are bearing fruit. Average annual meat production grew by 9 percent in 1983 and 1984, milk production increased by 8 percent, and egg production grew by 6 percent. When this year's plan has been fulfilled,

the procurement of meat in live weight will have increased by 2.5 million tons compared with 1982, milk procurement by 9.2 million tons, and egg procurement by 3.5 billion eggs. The procurement rates achieved for livestock products assure the fulfillment of plans and socialist commitments accepted by the kolkhozes and sovkhozes for 1985. The nation expects the largest procurement volumes of recent years for meat and milk.

A great deal of attention has been given to the preparation and accumulation of rough and succulent feed and the improvement of its quality. New feed preparation facilities have been built and existing ones put into order on the kolkhozes and sovkhozes, and livestock buildings, recreation and reading rooms and lounges for the farm workers have been repaired. Everything necessary has thus been done to provide shelter and adequate feed for the wintering and to create good conditions for further increasing the production of meat, milk, eggs and wool. In short, all of the prerequisites have been created for the successful fulfillment of plan assignments in the concluding year of the current five-year plan and a good start for the 12th Five-Year Plan.

What we have achieved is a natural result of the enormous, purposeful organizational work performed by party and soviet organs to mobilize urban and rural workers to fulfill the vast social and economic program advanced by our party. The good figures for the production and procurement of livestock products convincingly demonstrate a profound understanding and approval of the CPSU's policy by the Communists and all of the nation's workers, and of their great responsibility for accomplishing the large-scale tasks involved in further enhancing the well-being of the Soviet people and considerably improving their food supply.

The stage of direct preparations for the 27th CPSU Congress began following the April 1985 plenum. The nation is hard at work. It involves all of the labor collectives and all areas of life of the Soviet society. The 27th CPSU Congress is to approve a new edition of the party Program and the Main Directions of National Economic and Social Development for the 12th Five-Year Plan and the Period Extending to the Year 2000. Very large tasks have been set in the livestock branch both for the forthcoming five-year plan and for 1986. State procurement plans alone will be increased by 3 percent next year. In order to successfully carry out the tasks set by the party in the accomplishment of the Food Program, the kolkhozes, sovkhozes, agricultural and procurement organizations, and state inspectorates for the procurement and quality of agricultural products should give very serious attention to the results of the work performed in animal husbandry during the fourth quarter of this year and the first half of the coming year.

In the decree "On the All-Union Competition for the Successful Wintering of the Livestock and for Increasing the Production and Procurement of Livestock Products During the 1985/86 Winter Period," the CPSU Central Committee, the USSR Council of Ministers, the AUCCTU and the Komsomol Central Committee set the task of assuring a high level of organizational and political work, concentrating it directly on the livestock farms and complexes, in the shops, brigades and teams. The main thing is not to permit a drop in the production



and procurement of products. Life insistently demands a progressive build-up of meat, milk and egg production during the winter period. The experience of last winter convincingly confirmed the well-known fact that real concern for animal husbandry combined with the skillful application of moral and material incentives, as well as the collective methods of organizing the labor of the farm workers, makes it possible to obtain the maximum output even in difficult weather conditions. The leaders of state inspectorates for the procurement and the quality of agricultural products in the krais, oblasts and rayons, which are full members of the councils of the agroindustrial associations, along with fulfilling their direct duties, must therefore not ignore the production of livestock products, labor organization and wages for the livestock workers, the complete provision of the farms with highly skilled cadres, and the creation of the conditions necessary for their work, relaxation, medical, cultural and personal services.

Workers with the state procurement inspectorates should take an active part in the organization of socialist competition among the livestock workers. They should be strict in the agroindustrial associations with respect to the squandering of feed, poor utilization of the feed preparation shops, machinery and equipment of the farms and unsatisfactory provision of the farms with electric energy, fuel and hot water. They should do everything possible to help the kolkhozes, sovkhoses and procurement organizations to fulfill plans and socialist commitments, and should strive persistently to draw the maximum quantities of livestock, milk, eggs and other products into the state stocks in order to assure the absolute fulfillment of the procurement plans set for 1985. They should also take advantage of every opportunity to make up shortfalls which developed during the first years of the current five-year plan.

Enterprises of the balanced rations industry, which make an enormous contribution to the work results of the farms during the winter, must provide the livestock workers, primarily those on the poultry farms and the large complexes for the production of beef, pork and milk, with a great deal of assistance in increasing output. These enterprises are required to fulfill without interruptions plans for the production of balanced rations, vitamin and protein supplements and admixtures, and to deliver them to the kolkhozes and sovkhoses. Particular attention should be given to the quality of the products, and poor-quality balanced rations not conforming to state standards should not be allowed to be delivered to the agricultural enterprises. Enterprises of the balanced rations industry can provide the kolkhozes and sovkhoses with considerable assistance with respect to providing animal husbandry with additional sources of feed by making maximum use of the production of granules, pellets and mixtures from by-products of the grain milling industry for this purpose.

Speaking of the thrifty and careful use of all types of feed as the main condition for increasing the productivity of the livestock and of the need to thoroughly prepare it for feeding, particular attention should be given to the efficient use of feed concentrates. This type of feed must not be released to the farms without the rations being approved by the farm managers, and it is particularly important that they be weighed. The release of

feed concentrates from the kolkhoz and sovkhos storage facilities and payments out the farm cashier's offices must be monitored equally strictly.

An increase of 2 million tons of meat (dressed weight) is anticipated in the final year of the 11th Five-Year Plan over the 1980 figure. However, a considerable number of kolkhozes and sovkhos and even large livestock complexes and poultry farms are not coping with the fulfillment of state plans for the production of livestock and poultry and their sale to the state.

Despite this, many state inspectorates continue to act merely as observers and permit the slaughter of a large quantity of livestock on the kolkhozes and sovkhos, the uncontrolled consumption of meat products for the internal needs of the farms, and the sale of meat to individuals who do not work on the farms or to outside organizations. A considerable portion of the products do not go into the state supply as a result. Furthermore, the farms ordinarily slaughter the livestock at low weights.

In recent years a considerable quantity of cattle have been slaughtered before reaching the proper weight standards on farms of the Russian Federation, the Ukrainian SSR and the Belorussian SSR. Above-norm consumption of meat for internal farm needs has been permitted on sovkhos of the RSFSR, including Stavropol and Krasnodar krais and Volgograd Oblast, as well as the Kazakh SSR.

Increasing the weight of livestock sold to the state is a matter of considerable importance with respect to replenishing state meat stocks. Unfortunately, a number of republics, krais and oblasts have dropped below the levels already achieved. During the first half of 1985 there was a drop in the average weight of cattle entering state stocks from kolkhozes and sovkhos of the Uzbek SSR, the Kazakh SSR, Sverdlovsk and Ivanovo oblasts in the RSFSR, and the Ukrainian, Moldavian and Georgian Union republics. From January to September of this year eight Union republics delivered cattle with lower weights than during the same period of last year to meat industry enterprises.

The delivery of a large quantity of thin livestock for slaughter is considerably reducing state meat stocks. More than 20 percent of the cattle and 74 percent of the sheep delivered to processing enterprises of the Kirghiz SSR during the first half of this year were thin, for example. State inspectorates for procurement and for the quality of agricultural products must involve themselves in organizing the raising of the young animals and see to it that the fattening of the herd is begun and ended at the right time.

We cannot accept as normal the situation in which livestock readied for slaughter are held far too long on the kolkhozes and sovkhos. This leads to breakdowns in the replenishment of state meat stocks, to the overconsumption of feed and to other nonproductive expenses, and disrupts the work flow at enterprises of the processing industry. There have been cases of delaying the release of livestock by farms which did not fulfill the state meat procurement plans this year as well.

We know that the bulk of the milk is obtained during the period when the animals are stalled. This places great responsibility upon workers of the state inspectorates and procurement and for the quality of agricultural products. It is their duty to see that the milk produced on the kolkhozes and sovkhoses is properly utilized and that the maximum amount reaches the state procurement enterprises. At the stage when the gross milk yields are planned, the inspectorates should demand that all of the commercial product be designated for sale to the state. Such a reserve for increasing the marketable volume as the efficient use of whole milk substitutes, particularly industrially produced ones, should be used more extensively. We must put an end to the unaccounted-for use of substitutes and prevent them from being fed to the young animals in excess of the rates of whole milk consumption specified in the production financing plans.

Every kilogram of substitute should release an equivalent quantity of whole milk to be used in food.

Despite the fact that there is still a certain shortage of milk and milk products for the population in a number of regions in the nation, many farms are permitting calves to be fed whole milk considerably in excess of the norm. This is happening on farms of Gorkiy, Kaluga, Kemerovo, Kustanay, Kherson, Khmel'nitskiy and other oblasts. The state procurement inspectorates must erect a solid barrier to such infractions of planned discipline.

The procurement of excess livestock products from the personal plots is an important source for replenishing food stocks. During the winter time organizational work must be intensified in this area, the receiving points must be precisely designated and properly equipped, competent people with initiative must be assigned to work there, they must be provided with transportation, and good conditions must be created for receiving and releasing the products. Every citizen with excess meat, milk, wool or eggs should be able to sell them to the state without hindrance at any time.

The Union republic ministries of procurement and their local agencies must carefully monitor the work of the procurement organizations and strive to see that the livestock products are accepted and the paperwork for them performed promptly and correctly.

The introduction of the system of receiving livestock and milk right where they are produced and their removal by special transport of the procurer is one of the important ways to improve the organization of procurement, to reduce losses of products and to preserve their quality during the selling process. The May 1982 Plenum of the CPSU Central Committee called for the complete conversion to this procurement system during the 12th Five-Year Plan. A study has shown, however, that the present rate of adoption of this system is still not adequate to accomplish the task set by the party. In 1984 29 percent of total procurements of livestock and 33 percent of the milk were accepted by procurement organizations at the site for the nation as a whole. The work is being performed at that same level in this, the last year of the 11th Five-Year Plan.



Procurement organizations of the Tajik SSR and the Turkmen SSR have hardly begun fulfilling instructions from the party and the government on receiving livestock right on the farms. Too little is being done with respect to adopting the progressive method of receiving livestock and milk in the Uzbek SSR, the Kazakh SSR and the Kirghiz SSR. This is true for livestock in the Kazakh SSR. Those republics must take immediate steps to disseminate the new procurement procedure.

Carefully preparing for and conducting in an organized manner the campaign for the concluding of contracts for the procurement of livestock products in 1986 is presently one of the main tasks of the state inspectorates for procurement and for the quality of agricultural products. This work must be performed in close contact with managers and specialists of the procurement organizations, the kolkhozes and sovkhoses. The process of concluding the contracts must provide for the maximum inclusion of output in state purchases and its uniform delivery to the procurement points in order to achieve complete utilization of capacities at the processing enterprises and their smooth operation. The contracts should be analyzed in good time. They should be reviewed to see that procurement volumes coincide with the production level and conform to the established production-financing plans of the farms, and any deviations must be eliminated.

In view of the fact that the contract is the only legal document governing relations between the procurement organizations and agricultural enterprises selling products to the state, the state procurement inspectorates should demand that all of the columns and lines in that document be filled out in strict accordance with the Statute on the Procedure for Concluding and Fulfilling Contracts for Agricultural Products.

Nor can we ignore such a reserve for increasing the procurement of livestock products and raw material as their sale under contract by subsidiary and other farms which have excesses of these products but no state plans for their procurement.

It must be borne in mind that all kolkhozes, sovkhoses and other agricultural enterprises, and the subsidiary farms of state, cooperative and public organizations and enterprises must be covered by contracts for unprocessed leather, furs and pelts.

After this year has ended, the state inspectorates for procurement and for the quality of agricultural products are faced with the extensive and important job of seeing to the correct payment of the 50 percent increase in the procurement prices for products sold to the state over and above the level achieved under the 10th Five-Year Plan. The main attention should focus on the correct drawing-up of the collation documents and on seeing to it that the provisions in effect are strictly observed.

It was pointed out at the April 1985 Plenum of the CPSU Central Committee that the kolkhozes and sovkhoses and the processing enterprises have capabilities for considerably increasing the output of food products. These should be dealt with efficiently. There must be daily, purposeful work on the part of

the state procurement inspectorates to arrange for the state procurement of livestock products and raw materials during the 1985/86 winter period for the achievement of this goal.

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## REGIONAL DEVELOPMENT

## CONFERENCE-ON USE OF INTENSIVE TECHNOLOGIES IN FARMING

Omsk ZEMLYA SIBIRSKAYA, DALNEVOSTOCHNAYA in Russian No 9, Sep 85 pp 14-15

[Article: "Progress," under the rubric "Intensive Work for Intensive Technology"]

/Text/ This year the grain growers in Omsk Oblast, based upon the complete introduction of zonal farming systems and industrial technologies, must achieve a gross grain yield of not less than 4 million tons and by the end of the 12th Five-Year Plan -- 4.3-4.5 million tons. This task is a fully realistic one. Such results have already been achieved by the oblast: in 1979 -- 4.3 and in 1980 -- 4.1 million tons. Here we have in mind the need for making such results the norm and of making the yields more stable in nature.

A great deal has been accomplished in the interest of introducing scientific-technical progress into farming: the structure of the areas under crops has been improved, that is, it now conforms more to the zonal systems, the clean fallow fields have been expanded to the computed indicator, full use is being made of the soil-protective cultivation methods, varieties mainly of the intensive type are being employed for grain production and all labor-intensive processes are consistently being mechanized. All of this has made it possible to create the base required for converting over to a new and higher stage -- the extensive use of intensive technologies for the cultivation of agricultural crops. Thus it was by no means an accident when the oblast was assigned the task of mastering the use of the progressive technology this year on an area of 1,100,000 hectares of the 3,000,000 hectares available in the west Siberian region.

And thus on the eve of the final stage of this great work -- the busy autumn period in Omsk Oblast and on three farms in the oblast -- a 2-day conference-seminar was held during which measures aimed at harvesting and procuring the feed in an organized manner were thoroughly discussed. Many individuals participated in the work of this conference-seminar: sovkhos directors, kolkhoz chairmen, secretaries of party committees, the chiefs and chief specialists of rayon agricultural administrations, the secretaries of rayon CPSU committees, the leaders of oblast administrations and departments and scientists.

The 1st secretary of the oblast CPSU committee S.I. Manyakin opened the conference-seminar and delivered a speech.

Reports were also delivered by the secretary of the oblast party committee A.P. Leontyev and by the deputy chairman of the oblast executive committee Ye.G. Kononov.

In the reports and speeches delivered by those participating in the conference-seminar, a maximum amount of attention was concentrated on an analysis of current affairs. But discussions were also held on another subject -- the problems associated with the introduction of the achievements of modern science and leading experience into all elements of the harvest production line and the campaign being waged by the Omsk and Irtysh farmers directed towards raising the quality of the field crop husbandry products and ensuring complete protection for all crops cultivated. Beyond any doubt, this experience will be useful also to the field crop growers of other krais, oblasts and autonomous republics of Siberia and the Far East.

The construction of highly productive grain-cleaning complexes and storage areas is being carried out throughout the oblast at the present time. During the 12th Five-Year Plan, they will be placed in operation at all 63 farms specializing in grain production, farms which during favorable years produce approximately 2 million tons -- one half of the oblast's volume.

The Russko-Polyanskiy Sovkhoz was the first in the oblast to build such a complex with storage bins for 1,000 tons. Its productivity for the acceptance and processing of grain is 200 tons per hour. The handling time for large trucks has been reduced by a factor of seven. Sixty-five individuals and 12 automobiles have been released from having to perform work in connection with the threshing floor.

Grain storage areas located directly out on the fields have been employed successfully over a period of many years at the Novouralskoye OPKh /experimental model farm/. The advantages to be realized from them are great: a decrease takes place in the transport workload along the "field to threshing floor" route and the transport requirement for carrying out this work is reduced twofold.

Large grain-cleaning complexes will be built this year on 15 farms. Many industrial enterprises in the city of Omsk have actively joined in carrying out this great work.

Omsk Oblast occupies a leading place in the production and sale of high quality grain to the state. A scientifically sound system for growing strong wheat has been developed here. The following figures were mentioned during the conference-seminar. During 4 years of the five-year plan, 2,210,000 tons of strong, valuable and durum wheat were sold. The additional payment for high quality amounted to 57 million rubles. In addition, the farms earned 28 million rubles for the sale of high quality seed. Each year, 80-90 percent of the grain turned over to the state by Russko-Polyanskiy, Pavlogradskiy, Isilkulskiy and Maryanovskiy rayons and by many sovkhoses and kolkhoses is of a raised quality.

This year the oblast's farms plan to procure 2,109,000 tons of feed units of non-concentrated feed -- 18 quintals per standard head of cattle -- and to increase their production by 15 percent compared to 1984. The participants in the conference-seminar discussed in an active and interested manner specific measures for carrying out this difficult task. They displayed special interest in a report delivered by the 1st secretary of the Kormilovskiy Rayon CPSU

Committee G.M. Gorchakov. The local livestock breeders plan to reach the 3,000 level for milk yields next year -- based upon a strong feed base not only for the public herd but also for the private plots.

From the beginning, consultations were held with the scientists. The rayon concluded an agreement with a feed production laboratory of SibNIISKh /Siberian Scientific-Research Institute of Agriculture/. The planned program was approved by the bureau of the rayon CPSU committee. It embodies all that is new and all experience accumulated within the branch and throughout the country. The foundation for carrying it out is unconditional observance of technical discipline. All 14 farms now have efficient feed crop rotation plans, which are located as close as possible to the central farmsteads where the principal livestock groups are located. Feed production has been singled out as a separate branch with its own personnel, land and equipment. The establishment of intra-farm specialization in livestock husbandry is now nearing completion and this will make it possible to convert over to year-round multiple-component feeding for the animals using a common ration.

A shortage of seed for alfalfa, sweetclover, oil-bearing radishes and others is seriously delaying the implementation of the oblast's Belok program. Thus the decision was handed down calling upon farms to specialize in the production of such seed. Alfalfa seed is presently being grown by the kolkhozes Rodina and imeni XXI Syezda KPSS and sweet clover by the Novoalekseyevskiy Sovkhoz. The proportion of leguminous grasses in the perennial grass mixtures was increased to 32 percent.

Over the past few years, the farms have mastered a more progressive technology for growing peas with a yield in excess of 20 quintals per hectare. The area for this crop has been increased twofold -- by almost 5,000 hectares. Nobody campaigns in behalf of this crop and yet the rayon's goal is to have it occupy 10 percent of the grain structure.

The important problem of balancing the feed in terms of sugar is being solved through the cultivation of beets. Each farm now allocates 10 hundredths per cow for this purpose and this makes it possible during the winter to set aside 10 kg of this feed per animal.

A great economic effect is realized from the forced ventilation of hay, especially for irrigation purposes. Such units will additionally be placed in operation this year on eight farms. There is a twofold advantage: high quality and timely delivery of the hay to a forage storehouse. The measures undertaken are making it possible for the feed procurement specialists to obtain not less than 50 quintals of feed units per hectare from their irrigated lands.

An important reserve in the production of non-concentrated feeds is that of post-harvest sowings, which have been employed for three years in the rayon. More than 2,000 hectares of winter rye are used in June for green feed and for preparing vitamin meal and thereafter the sectors thus made available are sown in rape or a peas and oats mixture.

All of these measures aimed at increasing feed procurements have produced noticeable results. Over the past 3 years, milk production has increased by



crossing of hogs and in this manner they are obtaining 25-30 percent additional output. This method has been studied well and is available for use by all swine husbandry farms. However, it is being introduced into operations in a very poor manner.

If the delivery weight of each head of cattle was to be raised by 50 kilograms, not only would a solid increase be realized in the region's meat balance but in addition it would become possible to produce this valuable product considerably more cheaply and more economically than if the same increase was realized from increasing the number of animals.

Over the past few years, the farms of Siberia have imported 7,000 head of cattle at a cost in excess of 5 million rubles. In addition, 225,000 highly valuable heifers have been delivered on an inter-oblast basis at a cost of 225.7 million rubles. And what has been the result? Although the pedigree structure of the livestock improved, their productivity nevertheless remained at the former level and in fact it even declined in some instances.

A principal direction to be followed today is that of improving breeding work in livestock husbandry. Effort must be directed towards developing effective methods for selecting the animals and also efficient measures for preventing and eliminating diseases in them, particularly brucellosis and tuberculosis. And certainly, a great amount of work remains to be carried out in connection with strengthening the feed base. If this is not done, the livestock breeders will be unable to carry out their assigned task -- to practically double the production of milk and meat throughout the region.

The technological and organizational rebuilding of agricultural production requires the use of new approaches for realizing the potential of the agricultural science. Here we have in mind the need for converting it into a genuine catalyst for accelerating progress in the rural areas. And this work consists mainly of raising the level and results of scientific studies.

Recently, during an all-union scientific conference held in the city of Novosibirsk, where the problem concerned with developing the productive forces of Siberia and the tasks for accelerating scientific-technical progress were examined, it was noted that some scientific developments are of low quality just as in the past. Some of them are still being carried out in an incomplete manner, as a result of which fragments of a technology instead of a complete one are being recommended for use in production, fragments which do not always conform to the conditions found at a specific kolkhoz or sovkhoz. This represents one reason why a majority of the completed works never leave the walls of a laboratory. Thus, of the overall number of scientific-research works concerned with farming problems and the use of chemical processes, only 18 percent are being introduced into operations and of those concerned with feed production and mechanization -- 8-10 percent.

Or permit me to cite still another example. When processing milk using the traditional method (considered obsolete today), we eliminate from the food balance almost one half of the protein -- a product which is in short supply throughout the country.

more than 7,000 tons. In the process, the consumption of concentrated feeds per unit of output decreased considerably.

A necessary, interesting and useful discussion took place during the conference-seminar. The recommendations by the scientists and the exchange of experience will be of assistance to the farm leaders and specialists in making more complete use of the available reserves and in solving successfully the tasks assigned to them.

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## REGIONAL DEVELOPMENT

## OMSK SEMINAR REVIEWS INITIAL RESULTS OF INTENSIVE TECHNOLOGY

Omsk ZEMLYA SIBIRSKAYA, DALNEVOSTOCHNAYA in Russian No 10 Oct 85 p 4

[Article: "Siberia, the First Conclusions from the Wide Use of Intensive Technology Have Been Drawn"]

Text A zonal seminar held in the city of Omsk was attended by the chiefs and deputy chiefs of kray and oblast agricultural administrations for western and eastern Siberia, the Urals and a number of oblasts in Kazakhstan, scientists and executives of the RSFSR Ministry of Agriculture, departments, the Omsk Oblast Party Committee and the oblast executive committee.

The great organizational work being carried out by the party, soviet and economic organs of Omsk Oblast in connection with mastering the intensive technologies has been discussed on more than one occasion in our journal. It bears mentioning that the leaders of rayons, kolkhozes and sovkhoses, oblast departments and agricultural institutes met and exchanged opinions on the oblast's best fields prior to the mentioned conference. All noted with satisfaction that the yields were considerably higher than usual in those areas where the grain crops were cultivated this year using the intensive technology.

This year the intensive technology was employed here on 1,100,000 hectares and mainly in the steppe and forest-steppe regions, that is, under conditions involving insufficient moisture. The Omsk workers established a high goal for themselves -- to achieve an annual increase of approximately 1 million tons of grain, compared to goals planned earlier, to obtain a yield of 20-22 quintals per hectare following clean fallow and for the second crop following fallow -- not less than 15-18 quintals. Moreover, the grain must meet the highest requirements of the GOST /state standard/ for strong and durum wheat.

Just as in all other areas, the introduction of intensive technologies into operations is a new type of endeavor. Thus it required thorough professional knowledge and high organizational ability on the part of all individuals involved in this work. The requirements for carrying out the established grain production tasks using this technology were very strict. Hence the fine results noted by the participants in the zonal seminar upon visiting the fields in Omsk Oblast.

They viewed with satisfaction the experimental fields of the Siberian Scientific-Research Institute of Agriculture and the Omskoye OPKh /experimental model farm/,

where they became acquainted with the experience available in cultivating spring wheat using the intensive technology and a technological track and with new equipment for use in applying mineral and organic fertilizers, combatting plant pests and diseases, carrying out agrochemical inspections of soils and crops and for cultivating solonetz soils. They were shown modern items of equipment: soil-tilling, sowing and harvest machines and units and technical equipment for procuring feed. A great amount of interest was displayed in the experience accumulated throughout the oblast in the cultivation and stationary threshing of seed plants for alfalfa and grain crops.

The participants in the seminar visited the experimental plots of a corn selection laboratory of SibNIISKh /Siberian Scientific Research Institute of Agriculture/, where they acquainted themselves with the cultivation of rapid-ripening hybrids of this crop using the industrial technology and with the conservation and preparation of feed. The participants were shown new silage harvesting machines and equipment for the processing of rape and pea seed for feed purposes. At the Luzinskiy Sovkhoz, they became acquainted with the organization of work concerned with the repair and storage of agricultural equipment. On fields of the Druzhba Kolkhoz in Maryanovskiy Rayon, new types of harvest equipment were shown in operation: "Step" self-propelled harvesting complex, Zhkh-12 harvester-header, Don-1200 and Yenisey-1200 grain combines and equipment for diagnosing and carrying out operational repairs on equipment in the field.

As mentioned during the seminar, all of the above must be used rapidly and efficiently in production and for mastering the intensive technologies. Special attention was also concentrated on the mistakes and shortcomings in the intensification of field crop husbandry operations. In particular, the expenses of many Siberian farms are not fully justified; many leaders are expending kolkhoz and sovkhoz resources without giving any thought to whether or not their actions are advisable. In some areas the soil-protective system of farming is being introduced into operations more on the basis of words rather than actions. Almost all of the Siberian farms fail to consider the technological track, which makes it possible to apply a top dressing to crops and to treat them with various preparations throughout the entire growing season, as a mandatory component.

The participants at the conference listened to speeches delivered by the RSFSR Minister of Agriculture V.V. Nikitin and the 1st secretary of the Omsk Oblast CPSU Committee S.I. Manyakin.

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## REGIONAL DEVELOPMENT

### AGRICULTURAL DEVELOPMENT IN SIBERIA REVIEWED

Omsk ZEMLYA SIBIRSKAYA, DALNEVOSTOCHNAYA in Russian No 11, Nov 85 pp 2-3

[Lead article: "Siberia, A Worthy Reception for the 27th CPSU Party Congress"]

/Text/ One glance at a map of Siberia and the Far East and many thoughts spring to mind. One ponders the unique conditions, scales and experience found here. Similar to the country's economy as a whole, it is impossible to imagine Siberia today without its powerful GES's /hydroelectric power stations/, the coal of the Kuznets Basin, Neryungri, the BAM /Baykal-Amur Trunk Line/, the metallurgists of Norilsk, without its petrochemical operations, its endless forests and leading science and certainly without its grain resources.

The might of our country is increasing and that of Siberia and the North will also increase. "But" commented the General Secretary of the CPSU Central Committee Comrade M.S. Gorbachev, in a speech delivered before a meeting of the party-economic aktiv for Tyumen and Tomsk oblasts, "however great the importance of Siberia and the Far East for the fate of the country today, we nevertheless are clearly aware that the role played by this region will increase immeasurably tomorrow. Thus, during the course of solving the more urgent tasks, we must today glance far into the future and literally into the next century. We must have a clear understanding of how best to utilize the colossal productive and economic potential of our Siberian lands."

In the complex of problems concerned with developing the productive forces of Siberia, one priority task is that of increasing the production of agricultural products to the maximum possible degree. The party has assigned the task of ensuring that the population in our region is reliably supplied with food goods and mainly by means of local production. This task can be solved only through the intensification of agriculture and its branches and based upon scientific-technical progress.

Over the past 10 years, 35 million rubles worth of capital investments were employed for the development of agriculture through the carrying out of a complex of operations in the regions of Siberia. During this period of time, the fixed productive capital and capital-labor ratio increased by almost twofold. Considerable increases took place in the deliveries of mineral fertilizers, equipment, feed additives and chemical agents for protecting plants.

The measures undertaken made it possible to increase the average annual gross agricultural output of Siberian kolkhozes and sovkhoses from 6.6 billion rubles during the 9th Five-Year Plan to 7.1 billion rubles during the 11th Five-Year Plan. Labor productivity was raised by 15 percent. Increases were recorded in the production of meat, milk, vegetables and potatoes and improvements were noted in the ability to supply workers with food goods.

Are today's rates of growth for the production of agricultural products in the regions of Siberia in keeping with the increasing requirements? There can be only one simple answer for this question: no, they are not in keeping with them. And the chief reason lies in the fact that the tasks for the intensification of agriculture are being solved all too slowly and inefficiently on many farms. One immediate task is that of eliminating the shortcomings existing here and intensifying a concentration of forces and material resources in the interest of achieving an all-round solution for the problems of agricultural production.

Special attention must first of all be given to the grain problem. During the current five-year plan, grain production is not only not increasing but in fact it has decreased compared to the ninth and tenth five-year plans. Over a period of 4 years, the farms in the Altay and Krasnoyarsk krais and also in Novosibirsk Oblast have fallen greatly behind in their grain sales. Meanwhile, it will be necessary during the next few years to increase the grain crop yield by 4-6 quintals per hectare. With regard to future prospects, it can be said that grain production in the region must be raised to 38-40 million tons. Such are the goals outlined in the long-term program entitled "Agrarian Complex of Siberia and the Far East."

Is this a realistic task? Science and practical experience answer this question affirmatively. It has been proven that at the present time the productivity of the grain fields of Siberia can be increased by 30-50 percent. This is borne out by the operational experience of hundreds of the region's farms during the years following the May (1982) Plenum of the party's Central Committee.

The General Secretary of the CPSU Central Committee M.S. Gorbachev, in a speech delivered during a meeting of the party-economic aktiv on 7 September 1985 in the city of Tselinograd, discussed in detail the practical problems involved in achieving a further increase in grain production. During the years of the forthcoming five-year plan, we must attach priority importance to the cultivation of grain crops based upon the use of intensive technologies.

The new technologies are acquiring greater respect both in Siberia and the Far East. In the Altay Krai and in Novosibirsk and Omsk oblasts alone, approximately 3 million hectares were allocated this year for the production of spring wheat using an intensive technology. Despite the caprices of the weather, a solid increase in yield was obtained here. And the intensive fields will expand even more in the future. As noted during the meeting of the aktiv, a requirement exists for ensuring that fertilizers, equipment and other resources are concentrated here. This will serve as a guarantee that high yields will be obtained and that grain production will acquire the required degree of stability.



At the present stage the big question is adherence to technological discipline in the fields. Crop cultivation requires subtle and educated work from the farmer. This is why one must teach people that without profound knowledge it is impossible to get big harvests today. Now while the grain growers are involved with winter agronomy studies, it is particularly important to draw their attention to the quality and effectiveness of the expertise of each of them.

In many areas, only weak use is being made of the opportunities afforded by scientifically sound farming systems. They are presently available for each zone and, in essence, for each farm. This is an important factor with regard to raising the productivity of land. However the scientific recommendations, especially those concerned with the structure of the areas under crops, are being violated. The grain fields of Siberia are 1.2 million hectares less in size than the figure recommended by science. Crop rotation plans have been introduced into use on only 90 percent of the areas. Full use is not being made of the measures established for protecting soils against erosion.

The neglect of any one element of a farming system tends to disrupt the entire cycle concerned with the harvesting of crops. This applies in particular to fallow land which, when properly prepared and worked, makes it possible even during dry years to obtain yields which are higher by a factor of 2-3 than those obtained following non-fallow predecessor arrangements. However, there are many farms which, although they have allocated sufficient areas for use as fallow, are nevertheless still not obtaining the proper yield. Work carried out with fallow is considered to be a vital undertaking -- a matter of conscience and honor for each Siberian agronomist.

Today it is impossible to ensure the stable management of agricultural production in the absence of reclaimed lands and particularly irrigated lands. The task consists not so much of expanding the reclaimed areas but rather raising the effectiveness of their use. In all areas the cultivation of crops on irrigated and reclaimed lands using intensive technologies must be ensured on a priority basis and concern must be displayed for radically improving the condition of reclaimed lands. Capital investments should be allocated specifically for this purpose. In our journal (Issue No. 7 for 1985), a large article by the deputy minister of RSFSR Minvodkhoz /Ministry of Land Reclamation and Water Resources/ N.N. Mikheyev was devoted to these matters. It provides a detailed description of the vast reserves which are still not being used on reclaimed lands.

During the forthcoming five-year period, large tasks will have to be solved in still another branch -- livestock husbandry -- which as yet has been influenced only slightly by scientific-technical progress. Many leaders, specialists and others are still attempting to increase their production of meat, milk and other products through the use of extensive factors.

During the meeting in the city of Tselinograd, mention was made of the fact that we must concentrate attention not on increasing the number of animals, since this involves large expenditures for new construction of farms and for service personnel, but rather on the decisive introduction of intensive methods of production. In all probability there are and there will be rayons and even

oblasts where the number of animals should be increased, assuming that feed production is being developed at leading rates. But the main attention should be focused on the intensification of livestock husbandry.

Progressive methods for the selection and breeding of agricultural animals are still being developed and mastered only slowly within the region. Here is a specific example. Farms of the Omskiy Bekon Association and a number of other Siberian kolkhozes and sovkhozes are successfully employing the industrial

It was emphasized during the meeting that greater concern must be displayed for ensuring that research achievements are advanced rapidly into practical use. Various forms are available for accomplishing this. But experience has shown that the best form is that of a scientific-production association. This fact has already been checked and proven by many years of practical experience.

Recently, the expression "Everything grown must be protected" has appeared frequently on the pages of our journal. The problems concerned with the storage and processing of agricultural products are of vital importance to Siberia and during the 12th Five-Year Plan this third sphere of the agroindustrial complex must be developed at leading rates. This is a requirement of the party's Central Committee. Thus a great amount of work must be carried out at the present time in order to find the resources needed for creating the logistical base for storage and processing.

A change for the better has recently taken place in the economic situation in the rural areas. The number of unprofitable farms has decreased by 50 percent and production profitability has increased. However, by no means has all of the work been carried out. For example, the average rates of growth for labor productivity at Siberian kolkhozes and sovkhozes during the 11th Five-Year Plan were lower by a factor of almost 1.5 than those for the 10th Five-Year Plan. The material intensiveness of production operations continues to remain high. Mineral fertilizer is being used in an inefficient manner on many farms. As a result, production expenses in recent years have been increasing rather than decreasing. More than one third of the region's farms are unprofitable.

In short, the workers attached to the agroindustrial complex for Siberia and the Far East have many complicated and responsible tasks confronting them, tasks which require serious and purposeful work. Many farms and subunits of the agricultural industry have a fine stockpile for successfully commencing the 12th Five-Year Plan and for worthily preparing for the 27th CPSU Congress: the five-year plans and the plans for the final year of the 11th Five-Year Plan were fulfilled ahead of schedule. And this is inspiring confidence and providing new strength for developing the vast resources of Siberia and for achieving new goals in carrying out the country's Food Program.

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## AGRO-ECONOMICS AND ORGANIZATION

### APK CONFERENCE EXAMINES STANDARDIZATION, PRODUCTION QUALITY

Moscow STANDARTY I KACHESTVO in Russian No 11, Nov 85 pp 43-44

[Article by S. N. Semyonov of the Socioeconomic Problems of the Development of the Agrarian Industrial Complex Institute, Saratov: "Problems of Standardization and Quality at the All-Union Conference on Questions of Development of the Agro-Industrial Complex."]

[Text] The all-union scientific conference examining problems in the development of the agro-industrial complex (APK) was held in Saratov. The organizers included: Gosplan USSR, the Economic Department of the USSR Academy of Sciences, Gosstandart, the Scientific Council for Socio-Economic and Legal Problems of the APK, USSR Academy of Sciences, the Institute of Socio-Economic Problems of Development (ISEP) of the APK USSR Academy of Sciences, and the Central Directorate of the Scientific-Economic Association.

Opening the conference, first deputy chairman of Gosplan P.A. Paskar noted that the country's APK now occupied one of the leading places in the socialist economy. More than 48 million people work here, and more than 30 percent of the nation's basic production fund is concentrated here. One third of the economy's capital investment is in the branches of the APK.

Production in the agro-industrial sector and industrial goods made from agricultural raw materials account for 95 percent of foodstuff production and make up more than 75 percent of commodity circulation.

In considering the main socio-economic goals of the APK in the near term, the speaker emphasized that agro-industrial production's transition to a path of intensive development requires a growth in the production of end products that outstrips the growth in the volume of raw materials used; levels of demand for food products must approach scientifically established norms, etc.

Questions of developing structures and economic mechanisms for the APK were discussed in speeches by the chairman of the Council on Socio-economic and Legal Problems of the APK, USSR Academy of Sciences, and members of the Academy of Agricultural Sciences imeni V. I. Lenin, V.A. Tikhonov; USSR Gosplan section chief A.S. Popkov, USSR deputy minister of agriculture A.I. Ievlev; deputy chairman of USSR Goskomtsen A.A. Stolbov; deputy



chairman of Goskomselkhoztekhnika [State committee for Agricultural technology] V.M. Shvidko; chief of the economic plan directorate of Minselkhozmashta V.G. Polyansky; deputy minister of RFSFR fruit and vegetable production N.V. Averyanov; member-correspondent of the Estonian SSR Academy of Sciences M.L. Bronstein; member-correspondent of the Latvian SSR Academy of Sciences A.A. Kalninshi; member-correspondent of the Ukrainian SSR Academy of Sciences A.M. Onishchenko, and others.

V.P. Melkinov of the Krasnodarsky branch of the All-Union Standardization Scientific Research Institute (VNIIS) examined the basic direction in adopting standardization in developing the economic mechanism of the APK.

The speaker believes that the existing stock of technical-norm documents on standardizing APK production is not optimum, that the dynamics of standardization do not always keep pace with the development of the complex. A standard for end products must be set that meets or surpasses what the world achieves in practice. There is a pressing need to work out classification groups for similar APK products.

M.V. Dyachenko and I.A. Yatsenko (Krasnodar branch of VNIIS in the paper "Program-goal management of agro-industrial combines on a standardized base" examined the principles of setting up a technical-standard system of management based on an interbranch balance of standardization objectives (MOBOS).

Establishing a system of program-goal management at the "Kuban" combine will allow (according to preliminary calculations) an increase in production by 1990 of grain, sugar beets, vegetables, fruits, fodder, meat and milk.

The paper of T.D. Bakinov (city of Elista) concludes that effectively solving the problem of wool quality depends on interbranch cooperation on this matter in the APK. He notes that of the standards in the procurement and treatment branches, practically no significant quality of wool has a uniform standard. To insure comparable value in raw materials and finished products, a single standard of general technical requirements should apply to procurement and processing.

Problems in maintaining the standards for machine-building production in non-machine-building branches of the APK were dealt with in papers by S.N. Semyonov (ISEP APK) and M.E. Kunyavsky (Saratov Economic Institute).

It was noted that there were shortfalls in covering deficits in machine-building work and service by the APK's own production branches. For example, 70 percent of the major equipment repairs at Rosselkhoztekhnika are carried out under primitive conditions in the light repair workshops. The so-called territorial standards (TST) for machine-building production at non-machine-building branches of the APK are intended to be introduced into the system of general technical and organizational method standards of quality control in regional agro-industrial combines (APO).

A paper by R.M. Dolgopyatov, M.V. Kharkhardin and A.I. Bezrukov (Scientific production Association "Agropribor") dealt with the problem of the technical rearmament of the system of gathering and processing technological and other information, and establishing a system of APK information resources. Within the parameters of the Uniform System of Standards for instrument-building the "Agropribor" worked out a complex system of norm-method documentation for managing the technical-political development of the APK measuring-instrumentation stock. The "Agropribor" carried out "land surveys, based on technological agriculture production." The surveys included all quantifiable measurements that could be directly controlled by automatic systems, both in plant and animal husbandry, and also listed production quality indicators reflecting the demand for agricultural raw materials etc. The goal of the survey is to set up technological control points in conformity with the standards, designate a means of control at each point depending on the mission of the control, and equip APK branches with the means to set up active control to meet norms and govern the introduction of technological processes.

V. Ya. Glickman (kolkhoz "Ropazhi" in the Latvian SSR), R.M. Dolgopyatov and L.L. Sokolov ("Agropribor") spoke on "Standardization of technology as a means of controlling quality in work and products." They used the experience of working out and introducing standards at the "Potato Production" enterprise. Good results were obtained. Thus, the harvest on an experimental tract consisted of 302 quintals per hectare, while the control tract yielded 260. (For the last few years the maximum yield for potatoes did not exceed 170 quintals per hectare.)

"Standardization of production service as a direction for modernizing the economic mechanism of the APK" was the theme of a paper by I.M. Molochnikov and V.A. Gubin of the Krasnodar branch of the VNIIS. The speakers emphasized the idea of a methodical approach to standardization of production services by establishing a nomenclature of indicators for service quality with defined characteristics and concrete standards included. It is necessary to take into account the requirements of the purchaser (agriculture) for services, and integrate the servicer's standards with those of agricultural production.

In considering the question of modernizing production planning in the APK production subcomplex, I.N. Kozelskaya (ISEP APK) proceeded with the goal of basing the optimum level of production quality on a precise calculation of expenditures for quality and the effectiveness of raising quality, and putting this in a statistical base.

V.P. Andreev and V.A. Slastunov dealt with improving interrelations in the APK regarding production of high-quality grain. They propose setting up special bread-reception points to receive only hardy and resistant wheat so that it doesn't get mixed in grain elevators or warehouses before processing. To raise economic incentives for increased production and procurement of high-quality wheat it is necessary to further improve its worth.

G.M. Palamarchuk (Institute of Economics,) Ukrainian SSR Academy of Sciences) considers it expedient to institute an approach to paying for raw materials by taking better account of the proportion of usable matter in agricultural raw materials. The portion of means now expended on increasing production, the author contends, would be better spent on improving the quality of what is produced. The importance of adopting this proposal is indicated by the need to overcome the tendency toward declining quality in the raw materials being processed.

U.G. Gusmanov and R.G. Sabiryanov (BF [not further identified], USSR Academy of Sciences) in the paper "Improving the economic mechanism in the milk subcomplex of the APK" noted that state standards for milk do not take into account or measure albumen or milk sugar, and so do not adequately reflect the quality of the product.

The conference participants adopted recommendations, a significant portion of which were aimed at problems of quality. Thus, to ensure the output of high-quality APK products, it is most important to raise the scientific level of planning and control of quality parameters. The task of raising the quality of APK products, using a whole complex of scientific-technical programs, state standardization plans and production programs, must be coordinated with quota schedules and supported with corresponding material-technical resources.

For successful fulfillment of the country's food program it is necessary to improve the structure of the various products of the APK to ensure that each product in the range of goods is produced in optimum volume. In order to take quality indicators into account in planning and economic incentives, it is necessary to work out state accounting and a system of economic information regarding the quality of APK production. The need is growing to form a market trading bank for APK products and use it for present and future planning.

Measures to improve quality-control methods for APK products ought to be speeded into effect: automatic control-measuring work, development of instruments and laboratory equipment and a corresponding level of agro-industrial production. In the general scheme of APK management, it is necessary to increase the role of standards and the development of economic mechanisms, a scientific level of planned standardization on the basis of systematic approaches and program-goal methods.

Using the positive experience of local Gosstandart organs in the Ukraine, in Byelorussia, Moldavia, Uzbekistan, Georgia, Kazakhstan, and Kirghiziya, it is hoped that standardization and metrology centers will be established; oblast-level laboratory inspectors for standards and technical measuring units for agricultural and food products and relieving the adversary relationship between producing, procuring, and processing organizations and enterprises in the rayon agro-industrial association.

According to the experience of the Krasnodar branch of VNIIS it is expedient to expand and deepen research on scientific-methodical bases

for establishing territorial APK standards as elements of a state system of standardization.

There is a growing need to establish a scientifically based system for controlling quality parameters in agricultural production, and designing and implementing measuring devices.

In plans for the economic and social development of APK regions it is advantageous to have a system of guidelines for completing repair work and for producing mechanization means and non-standard equipment.

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AGRO-ECONOMICS AND ORGANIZATION

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FEED GRAIN SUPPLY, DISTRIBUTION COSTS EXAMINED

Moscow EKONOMIKA SELSKOGO KHOZYAYSTVA in Russian No 12, Dec 85 pp 31-34

[Article by L. Smutchenko, director, Limanskiy Sovkhoz, Kherson Oblast, and V. Miroshnichenko, chief, Laboratory of Industrial Engineering, Kherson Oblast Administration of Grain Products: "Interbranch Cooperation: Pro and Con"]

[Text] Limanskiy Sovkhoz is a large-scale interbranch farm. Each year of the 11th Five-Year Plan, it has sold to the state, on the average, 4,500 tons of grain, including 2,000 tons of forage; 3,300 tons of milk; 800 tons of meat and up to 10,000 tons of vegetables, fruit and berries. Its average annual profit has been more than 1.5 million rubles. The long-range plan calls for considerable growth in the volume of grain, meat, milk, vegetable and fruit production, yet the main stress is placed on the intensification of grain production and output in animal husbandry. A substantial reduction is intended in the production costs of animal products, as is an improvement in the cost-effectiveness of the branch and in capital productivity. However, the efforts of the sovkhov workers are not the only factor in this undertaking.

The farm's partners in the framework of the Agro-Industrial Association (APO) are the feed factories and the intake and supply bases of the Kherson Oblast Administration of Grain Products, which supply mixed feeds to the sovkhov for livestock rearing. The farm took in 900 tons of them from state resources in 1983. This included the return of about 675,000 tons of unprocessed grain that the sovkhov had sold to the above-mentioned bases at the time the plan for grain sales was being fulfilled. And whereas these bases pay for the transport of grain from the sovkhov production run, the delivery of mixed feed is paid for from the means of the sovkhov. However, the feed is sold to the farm at the industry's wholesale prices (without turnover tax), including the cost of transporting the grain from the production site to the intake-supply base, which the sovkhov had paid earlier. In actual fact the sovkhov's cooperation with the industrial enterprises in mixed-feed production amounts



to this: the farm pays for the transport of unprocessed grain from its own means, from the production run to the intake-supply bases of the oblast administration of grain products and for the return transport of finished products (feeds) and also pays costs of production of feed plants and processing organizations that make a profit from these same products.

Whereas the sovkhos sells unprocessed grain from June through September, the mixed feeds are purchased in the course of the entire year in accordance with the APO plan. As a result of this arrangement the transport vehicles make empty runs to the farm from the intake-supply bases during the grain procurement period, while empty runs in the opposite direction, from the farm to the bases and feed plants, are made during the entire year in connection with feed delivery. Thus, for planned cooperation with the purpose of processing 900 tons of mixed feeds on the basis of the unprocessed grain yielded at the sovkhos, the sovkhos incurs costs for the empty running of motor vehicles over an annual distance of 22,900 km, in which 9 tons of gasoline are consumed. The transported grain has been produced, that is, on the site at which the feeds will be utilized later. It is virtually impossible to load these vehicles with return freight. At the established rates for the transport of grain during its procurement period and the same grain in the form of feeds, calculated for the entire planned volume of supply, this costs the farm 5,130 rubles (5.70 rubles per ton, including the cost of 13 liters of gasoline).

Is it then possible, when mixed feeds are processed at a large-scale, technically well equipped industrial enterprise from large quantities of semi-finished raw material with intensive mechanization and automation of the production processes, that the total costs calculated in terms of 1 ton of feed (the costs of production for this enterprise and the transport costs paid by the sovkhos) shall be lower than the costs of producing the same quantity of feed at that very farm in its small-scale multi-purpose plant? (Indeed, only if this holds true is there any economic sense in the inter-branch cooperation called for in the plan.)

Whereas the production costs calculated for 1 ton of mixed feed at the sovkhos plant, which is obsolete in concept and equipment, amount to 2.5 rubles (exclusive of raw material cost), these costs for the plants of the feed industry (without raw materials cost) and the profit, which the farms pay, likewise calculated in terms of 1 ton of feed, add up to 15.37 rubles and with the transport costs paid by the farm, to 21.07 rubles. In other words, one ton of feed costs the sovkhos 18.47 rubles more when produced at the enterprises of the mixed-feed industry than when processed in its own facility. These are the same costs that must be borne as production costs for the yield of animal husbandry, although they do not contribute to an increase in the quantity of feed processed, the weight gain of livestock or the milk yield.

If we assume that the situation of Limanskiy Sovkhoz applies generally to the oblast, then according to our calculations, the unproductive costs for the 1982/83 agricultural year for animal husbandry in the oblast as a whole, taking only into account production within the framework of planned cooperation on the part of kolkhozes and sovkhozes with the enterprises of the feed industry, were 5.5 million rubles, including 1.7 million rubles in motorized transport costs. In this connection, the transport of unprocessed grain and mixed feed in the course of the year required 165 trucks daily, with annual expenditure of 3,900 tons of gasoline. At the same time, 1100 rail cars were employed in one year for supplying the needs of intra-oblast unprocessed grain shipping; for the most part, the cars were unloaded manually with the costs being paid by the kolkhozes and sovkhozes in the final analysis. It should be mentioned that the transport of feed generally entails considerable layovers of motorized freight vehicles for loading and of rail cars in unloading.

These extra expenses, which contribute nothing to the oblast's agricultural economy, will increase from one year to the next if the tendency continues to build large-scale mixed-feed plants to supply kolkhozes and sovkhozes with concentrated feeds bringing with it a contemporary level of automation, as well as the production costs and numbers of service personnel. Our calculations have shown that in 1985 the unproductive expenses in animal husbandry caused by this will rise throughout the oblast to altogether 9 million rubles, with 6,500 tons of gasoline consumed.

The unproductive costs for motorized transport for agricultural products in the oblast, which amounted in 1984 to 1.78 million rubles (including the cost of 4,200 tons of expended gasoline) will be reduced by half if the schedule is adjusted for simultaneous sale of forage grain and supplying mixed feed. In other words, unprocessed grain for the production of feed planned for issue in any way to the grain-producing kolkhozes and sovkhozes in the course of a year ought to be put in temporary guaranteed storage at the farms and removed according to the selection of the feeds. This makes it possible to eliminate empty runs by motor vehicles, thereby saving the oblast as a whole a total of 2,100 tons of gasoline annually and reducing the daily requirement for vehicles by 80 units. The effect of such a measure will not be felt in the work of the plants of the feed industry inasmuch as they have a store of raw materials for the interim. However, this is only a half or one-third measure, for in a given case the unproductive costs are lowered only by 16 percent.

The larger the feed plant, the greater the sum of capital investments, the more extensive the number of users served, the wider the range of intra-oblast transfers of unprocessed grain and feeds and the higher the unproductive costs (which today still are not compensated by a reduction in the production cost of feed output on a mass production basis at large-scale industrial



enterprises)--the production costs of the yield of animal husbandry at kol-khozes and sovkhozes will rise in proportion to the above magnitudes. For the rise in profits resulting from a fall in the production costs of the output of feeds is located at the large-scale industrial enterprise, whereas the growth of transport expenses, which the farms pay, is reflected in an increase of costs at those very sites.

At Limanskiy Sovkhoz today at the obsolete feed plant (the quality of whose work in no way satisfies the demands of animal raising) over 6,000 tons of mixed feed is processed from grain and purchased non-grain raw materials. If the capital output of labor by one middle-level worker at the plant is 20,000 rubles (according to the original cost of capital), the calculation for feeds processed in one day for one such worker is 5 tons here, but at the large-scale feed plants (the sovkhoz's partners) with a productivity rate of 630 tons per day, if the capital output is 40,500 rubles--3.3 tons. Here the total costs for processing of one ton of formula feed at a large-scale plant along with transport costs for the sovkhoz is 7.9 times greater than for sovkhoz production.

It should be mentioned as well that if a shortage of production capacities at the feed plants (even with three-shift work) diminishes the rate at which the oblast's animal-raising industry is supplied with feeds from state resources (even when raw materials are available), the corresponding capacities at interfarm plants (working a two-shift day) are not completely utilized owing to a shortfall of unprocessed grain.

Although the farms enjoy rights equal to those of the enterprises of the feed industry as members of the APO, the question of the use of production capacities of the interfarm feed plants has not been duly resolved in the interests of society. In 1983, in the oblast, 26 percent of the daily capacity, or 50.6 percent of the shift capacity, in terms of total production, went unused owing to a shortfall of raw materials (primarily of unprocessed grain); that is, in the course of a year there was a standstill at three operation-ready feed plants with a daily productivity rate of 640 tons each, the estimated cost of which was 22 million rubles.

Incomplete use of the production capacities of interfarm feed plants of the oblast in connection with planned two-shift work has a negative effect on their economic indicators; there is an increase in the specific values of amortization and the all-plant and shop expenses and a decrease in profit while the cost-effectiveness and productivity of labor and capital return are lowered. The average production cost of the processing of 1 ton of feed (without the cost of raw material) at the interfarm plants of the oblast

in 1983 was 5.5 rubles; with the transport costs borne by the kolkhozes and sovkhoses and the plants' profit, the full cost of production reached 10.65 rubles; this was lower by half than at the state feed plants under the same conditions, but four times as high as at the obsolete sovkhos plant. With this, the expenditure for gasoline for one ton of mixed feed is lower (the average transport distance from the plant to the livestock farm is 30 km) but about 1,000 tons is used at the annual volume of feed delivery. The total production expenses for the year's volume of mixed feed here exceed the costs of producing it at the kolkhozes and sovkhoses by 1.85 million rubles, including 437,000 rubles in transport costs. This also explains the constant reluctance of kolkhoz and sovkhos managers everywhere to move grain to inter-farm feed plants, which leads to delays and lowers the efficiency of feed production there and of the entire agricultural economy of the oblast.

As the above calculations clearly show, if the oblast's grain-producing farms are capable of high-quality feed output, it is still more cost-effective to produce it right at the kolkhozes and sovkhoses on small-scale but highly automated reliable equipment, using protein-vitamin supplements that are processed by the enterprises of the industry; these still fall short of the production volume demanded. Such equipment ought to be operated on a one-shift basis, tended by one or two workers.

Raw material arriving here for processing must be weighed automatically and the ingredients measured accurately and mixed thoroughly. Storage vessels for the finished output ought to be calculated for storage of the feed in an amount that will fill a two-month demand in their animal-raising operation in order to avoid additional shipments with loading/unloading and the losses that are inevitable in such cases. The protein-vitamin supplements should be delivered not in bags, which require great expenditures of manual labor for loading and unloading, but in elastic containers with room for 0.5 to 1 ton of protein-vitamin supplement (as used in shipping paint pigment) and should be loaded in bins with a crane.

Breathing mesh ought to be sufficiently tight that the product is not leaked (while allowing enough loss of waste); machine and transport assemblies should not have empty spaces in which the finished goods or raw material can be deposited; the total equipment assembly should facilitate work with maintenance requiring the least possible manual labor.

Equipment ought to be acquired with spares so that nothing will have to be completed on site (at the kolkhozes and sovkhoses) and the parts of the assembly ought to be integrated as simply as possible. Yet in actuality, if measures are taken for an increase in the volume of protein-vitamin supplement production, no one plans equipment for the feed-producing shops of the kolkhozes and sovkhoses or supplies them as complete units. At best, individual machines and assemblies for cleaning and chopping grain are delivered haphazardly to the farms.

Clearly, by using new, well-outfitted and highly automated equipment compared with today's small-scale multipurpose feed plants, as a result of saturation with the means of automation, the total costs of feed production at a farm can climb according to the growth of amortization, use of electrical energy and costs of tending machines. But even if costs of production calculated for 1 ton of feed at such a highly automated facility amount to actual costs at today's large-scale feed plants (which is virtually impossible), even then, according to our calculations the reduction in the profit of feed plants in the oblast by an annual average of 2.2 million rubles would result in almost 4 million rubles' profit for agricultural enterprises of the oblast thanks to a total reduction in the production cost for animal husbandry or receipt of 1.7 million rubles additional profit as a result of saving 3,900 tons of gasoline and the release of 165 trucks daily in the course of a year, as well as 1,100 rail cars, all of which can be used to deliver other freight. This would make possible a reduction of the seasonal work peak in using means of motor and rail transport and lower the number of shifts worked as well as the number of workers at the kolkhozes, sovkhoses and grain-intake enterprises.

In our opinion, it would be expedient to introduce in one oblast or one rayon, for the time being, a type of coordination of the times for sale of forage grain by the farms to the intake-supply bases and the receipt at the feed at the farms. It is thought that in such an experiment more positive than negative sides of the proposed alternative would show up and the model could form the basis for broad dissemination of the system.

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AGRO-ECONOMICS AND ORGANIZATION

FAMILY CONTRACT SYSTEM IN MOSCOW AREA SMALL FARMS

Moscow SOVETSKAYA ROSSIYA in Russian 10 Dec 85 p 1

[Article by N. Krasko "Family Contract"]

The family farm. This may seem unusual to you, but it should not. These days in agriculture, there are teams, brigades, and shops working on contracts, which surprises no one. But when the first dairy farm worked by a single family appeared in Podmoskoviye, it was a different story. The idea that a family contract is suited to a relatively small farm disturbed skeptics, who argued that only by industrializing on a huge scale, in complexes, can live-stock raising be improved. Aren't small farms obsolete?, they wondered.

Today in Podmoskoviye more than half of the cattle are found on such farms.

Let's look at them together.

The management of the collective farm "Vereiskiy" was not the best. When the young director, V.P. Nikonenko, took over, he was struck by one thing. There were not enough workers, and at the same time there were "do-nothing" people living in the villages, who had not long ago been called "not good prospects for employment". In almost every one of these villages, there were still old small farms with a low level of mechanization. What if they were overhauled and organized with a single-family contract. Anyone who acquired them would not need dairymaids or livestock workers. The family would be responsible for everything. And if the entire wage fund went to the family, the productivity of the herd would improve - the greater the productivity, the higher the income. In the village of Matyayeva, there was a small farm of 50 cows, and next to it a country house in which the Naumov family, Yuri and Anna, settled. Before that, Yuri and Anna had lived in a two-room apartment with all the conveniences. Anna worked in a laboratory, Yuri as a mechanic. They wanted to test themselves in some new endeavor, and were not afraid of work. The contract system promised tangible material gains, and improvement in their living standard depended on them alone.

And so they moved to their new home. Yuri had two tractors, an MTZ-80 and T-16 with a loader, at his disposal. They were given a wage fund, determined on the basis of an annual milk yield of 3500 kg per cow.

But it also covers creating a breeding nucleus on this same farm, and for selecting cattle suitable for breeding 500 head, so the wage fund will grow from 7,000 to 14,000 rubles per year. I ask Anna how she, by profession a turner, will manage cows.

"My mother was a milkmaid. I often helped her on the farm. And Yura was a metal worker at a dairy plant. My mother and father, who are retired, are going to come to work with us."

In a word, the settlers are in a fighting mood. They will go forward. Judging from the way things are going, the Naumovs will not be alone for long. It has been decided to modify an old cattleyard in Aleksin (in the same sovkhos, "Vereiski") for fattening 100 bull calves. It will also be on the family contract system.

An old cow-shed in the village of Subbotino will be modified into an inspection yard, which will be under a family contract. Step by step, small farms in "Vereiski" are producing more and more. Today Viktor Ptrovich is not alone in understanding the value of small farms under the family contract. Victor Vasilevich Aniskin is chairman of the Gorki Kolkhoz, which is not far from the ancient city of Klin. He is a young man like Nikonenko and shares his enthusiasm for the revival of small farms. A single female kolkhoz worker runs a rebuilt calf-shed on the edge of the village of Naprugovo in the Gorki Kolkhoz. M. Mareyeva, with help from her husband, raises 170 calves on a small rebuilt farm in the village of Golikovo. A 100-cow dairy farm which is to go on family contract is being rebuilt in the village of Zolino. This is not only economically profitable, but also socially important. 500 people live in the central living area of the Gorkii Kolkhoz.

"Who will take their place?" Aniskin asks. "That is a big question. I look at the children running around in the streets of our 'rural city' and think: How many of them will stay on the Kolkhoz? That depends on us, on management, on their parents. Today schoolboys help run many combines, but I believe that family farms will help young people to share their parents' interests, to become industrious, to understand and appreciate farm labor."

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## TILLING AND CROPPING TECHNOLOGY

### KAZAKHSTAN WIND, WATER EROSION PROTECTION MEASURES

Alma-Ata SELSKOYE KHOZYAYSTVO KAZAKHSTANA No 10, Oct 85 pp 16-18

[Article by Candidate of Economic Sciences V. Grigoruk, deputy director of the KazNIEOSKh (not further identified), and candidates of agricultural sciences and senior scientific associates I. Vorotyagin and O. Bragina, under the heading: "Zonal System, Path to Consistent Harvests": Improving Soil Protection"]

[Text] In Kazakhstan, great importance is attached to protecting land from wind and water erosion, to accumulating moisture and humus in the soil. The proportion of arable land in the republic with wind and water erosion is 42 percent, and the proportion of plowed land with such erosion is 59 percent. The use of potentially dangerous and eroded land in agricultural production has necessitated the use of a special farming system which ensures the prevention and elimination of erosion.

The soil protection system developed and successfully introduced in Kazakhstan is such a system. It anticipates a complex of organizational-economic, hydraulic engineering and forest reclamation measures. The measures most commonly used are agrotechnical erosion-protection steps which are effective and accessible to the farms: moldboardless cultivation to retain stubble, crop rotation with bare fallow, strip cropping, optimum sowing schedules for stubble sowers, introduction of drought-resistant strains, use of fertilizers and herbicides, sowing severely eroded land to grass, field-protection afforestation.

Republic farms are obtaining a more perceptible effect in the struggle against soil drying and erosion from the introduction of moldboardless cultivation to retain stubble. Erosion-protection technology increases labor productivity, reduces expenditures and lowers equipment requirements.

In spite of the undisputed advantage of this soil cultivation technology on eroded land, it is not being used in many oblasts and rayons. This is to be explained by the fact that a majority of the tools in the erosion-protection complex are currently being produced in insufficient quantity and are of poor quality. The spare products list is excessively broad and expenditure norms are excessively high due to the frailty of the equipment. Erosion-protection tools are often far from perfect. Thus, the KSh-3.1 boom cultivator used to cultivate fallow is hardly used by the farms, since it is unreliable. We lack tools for pre-sowing cultivation, leading to grain crop yield shortfalls of up to 1.5 quintals per hectare. The SZS-2.1 cultivator-sower cannot cope with pre-sowing cultivation.

The area being cultivated using moldboardless equipment is increasing, but this has been achieved only by increasing the time involved in this work and increasing the season load per piece of equipment, which negatively impacts field work quality and, as a consequence, agricultural crop yields. At the same time, the diversity of soil and climate conditions in Kazakhstan require a more differentiated approach to designing sowing machines so that they will correspond to the technologies and conditions in each zone.

The arid climate and the light-textured, heavily eroded soils increase the importance of a scientifically substantiated crop rotation including bare fallow. For the republic as a whole, 2,314 farms have instituted crop rotation, which covers 98 percent of all plowed land, and crop rotation is used on 73 percent of the area, most successfully on farms in Kokchetava (89 percent), Kustanay (84 percent), Severo-Kazakhstan (86 percent) and Tselinograd (83 percent) oblasts, where this work is close to being complete. It is going slowly on sovkhozes and kolkhozes in Taldy-Kurgana and Dzhambul oblasts, where crop rotation has been mastered on 26 and 33 percent, respectively.

One serious cause of the delay in mastering crop rotation on unirrigated land has been the expansion of the area under grains and fodder crops in crop-rotation fields at the expense of reducing the fallow area, the proportion of which is especially low on farms of such oblasts as Chimkent (four percent), Alma-Ata (nine percent) and Vostochno-Kazakhstan (six percent). In a number of instances, a lack of stability in sovkhoz and kolkhoz land use has had a negative effect on the effectiveness of mastering crop rotation. This, 20 new agricultural enterprises were organized from 1975 through 1983 in Kokchetava Oblast. In this regard, land redistribution affected 46 existing farms. As a result, there was a break in land use, boundaries were completely disrupted, and there was a temporary lack of responsibility for land use.

Agronomic personnel turnover has had a negative effect on the rate and level of crop rotation utilization. For example, in Kokchetava Oblast alone, 50 percent of the chief agronomists, 42 percent of the department agronomists and 48 percent of the seed-growing agronomists were replaced during 1976-1983.

Eroded soils lose fertility. Efficient fertilizer use is therefore of considerable importance in the soil-protection system. According to scientific research institution data, humus content drops from 1.1 to 0.6-0.8 percent during a period of active wind erosion. Systematic, scientifically substantiated application increases the fertility of eroded land. Under Kazakhstan conditions, an application of 60-90 kilograms of active-substance phosphate fertilizers to fallow fields and 10-20 kilograms per hectare when sowing in rows yields a positive result. When fertilizer is applied to a fallow field, wheat yields increase by 2.5 to 3.5 quintals per hectare; when applied to rows -- by 1.5 to 2.5 quintals. Republic farms can obtain 2-5 rubles of net income for each ruble spent on fertilizer.

In spite of the fact that mineral fertilizer deliveries have increased a little in recent years, fertilized area has been expanded through the introduction of more efficient ways and means of applying them, by adjusting the norms and by reducing fertilizer losses.

The KPG-2.2 subsurface cultivator - deep ripper - fertilizer currently being produced by the "Tselinogradselmash" plant permits applying fertilizer to the root layer of soil and thus obtain 1.2 to 1.5 quintals of grain per hectare more than with surface application of fertilizer using the RMG-4 or an aircraft. Unfortunately, an overwhelming majority of the KPG-2.2 subsurface cultivators are standing idle on the farms due to an inability to mechanize the fertilizer loading, as well as to a failure of the fertilizers used to conform to the GOST [all-union state standard].

The development of drought-resistant strains of grains is an inseparable part of the soil-protection farming system. However, there is little of this work in the republic. Thus, a Kazakhstan-selection strain occupied only 14.5 percent of the sown area in the republic in 1982. There are also shortcomings in preparing seed for sowing. Thus, only 40 percent of the total area was sown to first-class wheat seed, 56 percent to second-class. Some 62 percent of the barley sown was second-class, 32 percent third-class. Each year, up to 40 percent of the land in the republic is sown with non-certified grass seed, a consequence of the weak material-technical base and poorly organized post-harvest seed processing and cleaning. The problem of training seed selection and growing personnel remains unresolved.

The use of herbicides to fight weeds is an important element in the soil-protection system. The strong impact of herbicides as part of the soil-protection complex puts forward new agricultural technology demands, to wit, the development of soil cultivation equipment which will simultaneously apply herbicides. This country thus far does not, unfortunately, have herbicides and machinery which would not adversely affect the environment.

Field-protection afforestation is no less important an element of soil-protection measures. The sovkhozes and kolkhozes of Kazakhstan currently have 102,800 hectares of timber belts, which positively affect more than five million hectares. Many years of experience on the sovkhozes and kolkhozes shows that timber belts increase grain crop yields by an average of 2.5 to three quintals per hectare. In drought years, the impact of these belts increased two- to three-fold. Each hectare with timber belts provides farms with 400-700 rubles of net income annually (the value of the additional grain obtained), which exceeds 1.5- to two-fold the budget cost per hectare of trees seven to eight years old. Expenditures on field-protection trees are fully recompensed within a couple of years of timber belt "operation."

However, in spite of the clear benefits, an unsatisfactory situation has developed in the republic with regard to field-protection afforestation. The 9th and 10th five-year plans were not met in terms of creating field-protection timber belts; timber planting levels have dropped. Such oblasts as Kokchetava and Tselinograd practically stopped their field-protection afforestation this last five-year period, and the planting levels in Kustanay and Severo-Kazakhstan oblasts have dropped more than five-fold.

Understandably, the primary reason is the considerable difficulties involved in creating timber belts, especially given the lack of soil moisture. But it is also a matter of agricultural agencies in many oblasts not paying proper attention to setting up timber reclamation work and monitoring it. Farms lack agricultural timber reclamation specialists, reclamation brigades and links.

In order to improve the remaining timber, considerably more work is required. An area of 16,500 hectares needs repairs to thinned timber belts, 4,800 hectares needs renovation, 30,700 hectares needs stock maintenance, and the soil needs work on 38,400 hectares.

Republic soils have widespread water erosion, along with the wind erosion. It is most appreciable in Uralsk, Turgay, Tselinograd, Dzhambul and Chimkent oblasts. The complex of measures to combat water erosion includes: deep fall plowing (to 26-28 cm) across slopes; moldboardless soil cultivation, in combination with fall slitting to a depth of 50-60 cm; push plowing with hole digging and moldboardless plowing with heaping; slope contouring. In spite of the effectiveness of these methods, they are not being introduced into production aggressively. Thus, cross-slope soil cultivation is done on a republic average of 22 percent of the eroded arable land; slitting, hole digging and furrowing are done only on small areas of Alma-Ata and Taldy-Kurgana oblasts.

Slope contouring is done on 443,400 hectares, or only nine percent of the dangerously eroded arable land. The 1983 plan for terracing steep slopes was met by only 26 percent.

Failure to carry out the planned water erosion control measures is to be explained by a lack of estimate-planning documentation and by the poor production base of contractor organizations. Current republic practice does not ensure effective protection of land from erosion and needs to be improved. There is no single customer, general contractor or planner. The state funds allocated for erosion protection are scattered among various ministries and departments. We lack proper coordination of the implementation of erosion-protection measures, resulting in their being carried out haphazardly. Effectiveness decreases and investment reimbursement is slowed. Industry is not fully meeting agriculture's requirements for special erosion-protection machinery and spare parts for it. The quality of the erosion-protection equipment being produced remains poor.

In connection with the fact that the erosion-protection measures of 1969-1980 are obsolescent, we think it appropriate to work out new ones for the 1990-2000 period, both by oblast and for the republic as a whole, with consideration of the achievements of science and leading practice. Their development must be the responsibility of state land management planning institutes.

Land management plans are the basis for planning the complex of erosion-protection measures. In order to draw them up, we need to anticipate additional financing for land-management and planning-surveying work.

It is the oblast agriculture administrations which must be the sole customer in actually carrying out the complex of measures to protect land from wind and water erosion. The planning and agricultural agencies are obligated to set target limits as orders arrive for soil erosion protection measures.

Base-demonstration rayons and farms carrying out the entire complex of erosion-protection work should be designated to introduce and propagandize leading ways and means of combatting soil erosion. We should also set up the initial documentation for recording actual sowing patterns in crop-rotation fields, keeping field-history books and rayon crop-rotation registration books up to date.



With a view towards improving seed growing in the republic, serious work needs to be done on developing drought-resistant grain-crop strains suitable to the conditions in specific zones.

When the graded seed marketing plans are sent down, it would be appropriate to release elite-seed farms from the requirement to meet a commodity grain output plan. In this connection, we need to accelerate the construction and putting into operation of seed processing and storage centers.

In order to increase the effectiveness of fertilizer and herbicides use, we think the responsibility of the rayon and oblast agronomic services for this work sector should be increased and the specialization of intrafarm subdivisions should be intensified. It is appropriate to create chemization centers with full-time staffs at sovkhoz and kolkhoz central storage facilities.

It is appropriate that field-protection afforestation work be supervised by scientific institutions and done by timber-management enterprises. The primary focus of attention for farm and timber-management specialists should be on caring for, maintaining and renovating the remaining timber. The responsibility of enterprises of the timber management system for timber reclamation should be increased so that they become not only the contractors, but also the organizers of agricultural timber reclamation within the agro-industrial complex framework.

According to preliminary estimates, the introduction of the farming soil protection system system in toto will enable republic farms to obtain an additional three million tons of grain per year. The problems must therefore be solved without delay.

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## TILLING AND CROPPING TECHNOLOGY

### FALLOW AS WHEAT PREDECESSOR STRESSED FOR KAZAKHSTAN

Alma-Ata SELSKOYE KHOZYAYSTVO KAZAKHSTANA in Russian No 3, Mar 85 pp 22-23

[Article by Candidate of Agricultural Sciences A. Zadorin and Candidate of Economic Sciences L. Mozhayev under the heading "Farming. Zonal System: Path to Stable Harvests": "Basis of Intensive Technology"]

[Text] One of the primary conditions for increasing wheat yields is to put the crop in after good predecessors, the best of which is bare fallow. This has been revealed by many years of scientific research and has been confirmed by production experience.

Under arid steppe conditions, fallow is the most reliable, and thus far an irreplaceable, means of accumulating moisture. For example, according to many years of VNIIZKh [All-Union Scientific Research Institute of Grain Farming] data, by the spring sowing season, productive moisture reserves in bare fallow are 32-40 percent or more higher than in such predecessors as second crops after fallow, silage corn, wheat after corn or wheat after wheat. On 15-20 May 1983, that is, at the time of heaviest spring wheat sowing, productive moisture in bare fallow at the Kustanay Oblast station was 160 mm; it was 126 mm in the second crop after fallow and 94 mm for continuous wheat.

The higher moisture contents of fallow fields have been noted not only in laboratory analyses, but also visually. This is well known to field hands, as they often see that fallow plots dry out slower in the spring and so field work on them generally begins last.

It is also very important that the best moisture availability offered by fallow is most evident and has its greatest impact on yields in drought years.

Bare fallow plays a large role in combatting weeds. Success comes with repeated mechanical and chemical treatment as the weeds appear, as well as with long fallow periods. Experience has shown that ridding fields of weeds is facilitated by proper care of fallow strict adherence to cultivation technology, and the differentiated, comprehensive use of those agricultural technology methods which are most effective, depending on the conditions which develop. In the VNIIZKh research, the total number of weeds per square meter sown following fallow was 11 percent less as compared with repeat sowing and 26 percent less as compared with continuous wheat sowing.

Due to the fact that more-favorable water and nutrients conditions develop on a fallow field, and because there are fewer weeds, the moisture used there is expended more efficiently. According to that same VNIIZKh data, overall moisture expenditure on producing a quintal of grain was six percent higher when the crop wheat was put in after fallow and following corn than on sowings on fallow, and it was 18 percent higher than for continuous wheat sowings.

During 1981-1983, an average of 22.2 mm of moisture was expended to produce a quintal of spring wheat grain in research on sowings on fallow at the Kustanay Experimental Station, as against 25.4 mm when wheat followed wheat. At the Ruzayevsk Experimental Station, these indicators were 16.4 and 17.3 mm, respectively; at the Severo-Kazakhstan -- 14.3 and 15.9 mm.

Mineral nutrients accumulate for the plants more actively on bare fallow as compared with other predecessors. During the fallow period, there is a more unilateral accumulation of nitrogen, while stored phosphoric acid does not change substantially. Therefore, in view of the insufficiency of phosphorous in the soil and in view of the significant removal of it in harvesting, phosphate fertilizers must be applied to fallow fields. This is one of the most important methods of increasing yields.

Thus, these factors ensure a significant increase in yields in sowings on bare fallow as compared with other predecessors. At the VNIIZKh, for example, the average harvest over six years from sowings on bare fallow was 19.6 quintals of wheat grain per hectare, for a second crop following fallow -- 16.8 q, for a third crop -- 15 q, and for continuous wheat -- 10.3 q, that is, nearly two-fold lower than for wheat on bare fallow.

At the Ruzayevsk station, bare fallow provided an average spring wheat yield of 20.5 quintals per hectare during 1980-1983; a second crop following fallow yielded 17.8 q, a third -- 16, a fourth -- 14.5, and continuous wheat -- only 14.4 quintals. At the Severo-Kazakhstan oblast station, a two-year average of 27.7 quintals of wheat was obtained on bare fallow in a four-field grain-fallow crop rotation; second-crop yielded 19.8 q/ha, third-crop -- 15.4 q/ha.

Many farms have achieved good results by using fallow fields effectively. On the whole, it has been noted that yields following fallow significantly exceed harvests from sowings where grains have been put in continuously for more than two years on the sovkhoses. For example, sovkhos imeni Vilgelm Pik in Osakarovskiy Rayon, Karaganda Oblast, obtained two times as much grain from fallow fields as following grain predecessors. The second crop following fallow is also significantly higher, the impact still making itself felt. In the aggregate, the sovkhos put in 68 percent of its wheat following these two best predecessors and obtained 77 percent of its total gross grain harvest from them.

The relatively stable yields of on the order of 15-18 quintals per hectare following bare fallow and 12-15 quintals for second crops following fallow obtained on the arid-steppe zone sovkhoses examined (imeni V. Pik and Urozhaynyy in Karaganda Oblast, imeni Oleg Koshevyy in Turgay Oblast and Izhevskiy in Tselinograd Oblast) are quite high and testify to efficient land use.

Yields following bare fallow have increased to 20-25 or more quintals per hectare, and of second crops following fallow -- to 15-20 quintals, in the northern forest-steppe zone of Kustanay, Kokchetava and Severo-Kazakhstan oblasts.

The effectiveness of bare fallow was especially evident in the severe drought of 1984. The significantly higher yields from fields where wheat was put in as a first or second crop following fallow on many sovkhozes and kolkhozes of Kokchetava, Kustanay, Severo-Kazakhstan, Turgay, Tselinograd, Pavlodar, Aktyubinsk, Semipalatinsk and other oblasts confirmed once again the potential of fallow fields for further intensifying grain production development.

However, the proper return is not always obtained from bare fallow. There are quite a few examples of farms harvesting practically identical amounts from sowings following fallow as from sowings following other predecessors. Thus, Alabotinskiy sovkhoz in Chkalovskiy Rayon, Kokchetava Oblast, harvested 6.7 quintals of wheat, on average, on 2,500 hectares of sowings to fallow, while it harvested six quintals on the same area sown to a second crop following fallow and 6.1 quintals per hectare on 7,500 hectares sown to grains for more than two years. Overall yields on 13,400 hectares on this farm averaged 6.5 quintals, that is, practically the same as following fallow and as for second crops. The same situation obtained, for example, on the Put Lenina sovkhoz in Nurinskiy Rayon (Karaganda Oblast), Pobeda sovkhoz in Krasnoarmeyskiy Rayon (Kokchetava Oblast), Chapayevskiy sovkhoz in Leninskiy Rayon (Kustanay Oblast), Panfilovskiy and imeni Pushkina sovkhozes in Irtyshskiy Rayon (Pavlodar Oblast), imeni 60-letiya Sovetskoy Armii sovkhoz in Mamlyutskiy Rayon, Karagandinskiy sovkhoz in Bulayevskiy Rayon and Vostochnyy in Vozvysheyskiy Rayon (Severo-Kazakhstan Oblast), and on a number of other farms.

There are many reasons. Primary among them is simply poor care of fallow, and also inadequate use of procedures aimed at increasing the effectiveness of it.

The technology for working fallow is determined zonally by recommendations on agriculture management systems for each oblast. Use of the technology, doing the operations anticipated in the proper sequence and following definite schedules, ensures control of weeds and moisture accumulation and retention, in other words, good field preparation for wheat growing. We do not consider it necessary to describe this technology in detail, as it is well known to each production worker. However, one frequently encounters disregard of even the basic technological principles of this work.

For example, it is very important when the first spring tilling is done. According to scientific recommendations, the spring tilling must be done early. In the main grain regions of the northern zone of the republic, it is most efficient to do this between the time when the moisture is shut off and the time of intensive grain crop sowing, that is, prior to 15-20 May. This permits destruction of the shoots of early weeds and creation of conditions favorable to intensive germination of late weeds. But this rule is not followed on many farms, with fallow field work beginning after the spring sowing campaign is complete. Thus, the first tilling of fallow fields was only completed at the end of June this past year on sovkhozes and kolkhozes of Valikhanovskiy, Kelerovskiy, Leninskiy, and Chistopolskiy rayons<sup>in</sup> Kokchetava Oblast.

In a number of instances, the needed preparation is not done, meaning fallow is cultivated once a summer. There can be no hard and fast rules, of course, but cultivation in response to weeds would generally mean at least three or four times a summer. However, many farms which limit this work to cultivating twice consider that sufficient if the weeds do not go to seed. At the same time, they are not giving consideration to the loss caused due to nonproductive expenditure of moisture on the weeds that have emerged, even though they are in the end destroyed. Moreover, repeated cultivation would be needed anyway to exhaust the vital forces of the weeds which have taken root, in order to destroy them completely.

In many rayons with comparatively heavy soils, in terms of texture, it is appropriate to cultivate fallow to a depth of 25-27 cm in late August and early September. This improves soil moisture absorption ability and is also an effective tool in the complex of measures to destroy noxious perennial weeds. True, this is hard to do in some very dry years due to severe compaction of the soil, but it is often completely disregarded, to the detriment of the future harvest.

Such simplification of agricultural technology prevents full use of the potential of fallow land, and we know it lowers yield potential.

Along with cultivation, the use of herbicides has a significant impact on combatting weeds. It permits a reduction in the number of times the soil is loosened, which reduces moisture loss and improves the erosion resistance of fallow soils.

Proper care of fallow is one of the main conditions for successfully combatting weeds, but weeds continue to be a bad problem, one causing substantial harvest losses.

Very effective methods of increasing the effectiveness of fallow fields have been developed and are widely used. These include, first of all, the use of mineral fertilizers. Grain cropland in northern Kazakhstan basically contains sufficient nitrogen but a shortage of phosphorous. According to VNIIZKh, Kustanay, Severo-Kazakhstan and other experimental-station data, phosphorous application at a rate of 40-80 kg of active substance per hectare, depending on conditions, ensures an increment of two or more quintals in yields.

Fertilizers yield the necessary impact when farming standards are high, soil moisture is optimum, and weeds are absent. Thus, fertilizers are one of the interconnected elements of the farming system.

When fertilizers are applied to fallow, the result is also significant. For example, in VNIIZKh experiments, the application of 60 kg of active substance of superphosphate per hectare of fallow field yielded the following increments: 3.2 quintals for first-crop spring wheat following fallow, three quintals for second-crop spring wheat and 1.9 quintals for third-crop.

The effectiveness of fertilizers decreases in drought years and increases in wetter years. According to data from this same institute, the average overall spring wheat yield increment from superphosphate applied to a fallow field at a rate of 60 kg of active agent per hectare is 9.6 to 10.5 quintals of grain, total for first and subsequent crops.



At the same time, there is widespread use of a local method of applying fertilizers in small doses in the rows when sowing. It permits fertilizing a significantly larger area in one year, but it is more labor intensive. It is not more widespread due to the lack of sufficient fertilizer. In terms of effectiveness, these two methods are practically identical. Thus, the average yield at Karabalyk experimental station in Kustanay Oblast over three years (1979-1981) was 65.1 quintals of spring wheat per hectare in rotation when 60 kg of active-ingredient superphosphate per hectare was applied to a fallow field and 66.6 quintals for annual applications of 20 kg of active ingredient per hectare.

Increasing the rate of phosphorous application and additional applications of nitrogen did not increase yields.

Similar results were obtained at Ruzayevsk experimental station in Kokchetava Oblast. Yields averaged 17.7 quintals per hectare for a two-year crop rotation (in 1975-1983) with a one-time application of 60 kg of fertilizer to fallow and 15 kg to rows at time of sowing. Increasing the rate of phosphorous application to 90 kg per hectare increased yields to 18.7 quintals per hectare, but the return on the fertilizers dropped.

At the same time, applying superphosphate to fallow at full rates is less labor intensive and organizationally simpler. It is for good reason that the VNIIZKh experimental farm, the Stepnoishimsk experimental station in Kokchetava Oblast and other farms with the required amounts of fertilizers have for many years applied them one time, when cultivating fallow with ripper-fertilizers. However, a number of sovkhoses and kolkhoses sometimes resort to broadcast surface application, in violation of accepted technology. This leads to uneven application, losses and, in the end, to reduced effectiveness.

In order to increase soil moisture availability, snow retention is very important, windbreaks being the better choice for fallow fields and snow plows being better for nonfallow predecessors.

The use of methods to increase yields is most effective on fallow. For example, the five-year average spring wheat yield from bare fallow was 18.1 quintals per hectare at the Kustanay experimental station; it was 24.3 for fertilized windbreak strips and 20.8 for fertilization without windbreaks.

The next harvest, republic farms improved about five million hectares of bare fallow, which has been the maximum area in recent years and is close to the area needed to fully utilize the accepted crop rotations.

Thus, bare fallow is an important link in the system of measures aimed at increasing grain harvests, at increasing grain production intensiveness.

Aktyubinsk, Karaganda, Kokchetava, Kustanay, Pavlodar, Severo-Kazakhstan, Uralsk, Tselinograd and Turgay oblasts must use intensive spring-wheat cultivation technology on a total of 4.600 million hectares, with 2.450 million hectares to be bare fallow and 2.150 million second-crop following fallow. In this regard, they are to obtain at least 20-22 quintals of grain per hectare on fallow predecessors and 15-18 quintals on second-crop following fallow.



Fertilizers, pesticides, soil-cultivation, sowing, harvesting and other machinery are being allocated. It is the task of farm leaders and specialists to use this equipment, based on scientific achievements and leading experience, to realize a maximum return by obtaining a sharp increase in the production of high-quality grain and to make a worthy contribution to implementing the country's Food Program. Scientists must give them comprehensive assistance in this matter of great importance.

The current slogan for successful resolution of the tasks set each grain grower is the words of Comrade K. U. Chernenko at the October (1984) CPSU Central Committee Plenum: "The key problem, as before, remains steady growth in grain production. We need to ensure growth rates such that the country's grain requirements will be met in full in the years just ahead."

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## TILLING AND CROPPING TECHNOLOGY

UDC 613.11

### USE OF INTENSIVE AGROTECHNOLOGY FOR WINTER WHEAT CULTIVATION

Krasnodar SELSKIYE ZORI in Russian No 11, Nov 84 pp 8-10

/Article by V. Artemov, director of Lipetsk Oblast Agricultural Experimental Station: "From An Experiment To Extensive Use"/

/Text/ The Lipetsk Oblast Agricultural Experimental Station is a pioneer in the introduction of the intensive technology for the cultivation of winter crops in our country.

Last year, as a result of the use of this technology, a yield of 65 quintals of Mironovskaya-808 per hectare, with a gluten content of 29.3 percent, was obtained from a 50 hectare field at the station.

This year, the intensive technology was used for growing winter wheat on 10,000 hectares at 64 farms throughout the oblast.

For the harvest of the final year of the five-year plan, the Lipetsk farmers set aside more than 430,000 hectares for the cultivation of winter crops. The new technology will be employed on all of the fallow fields, which have been expanded to 130,000 hectares.

Just as in the past, a most important task of agriculture in our oblast during the present five-year plan and for the period up to 1990 continues to be that of increasing the production of grain. By 1985, the grain volumes will be increased by 32 percent compared to the 10th Five-Year Plan and by 1990 -- by 37.6 percent. In order to ensure complete support for public livestock husbandry in the form of concentrated feeds and in the interest of satisfying other intra-farm requirements, the plans call for the gross grain harvest to be increased to 2 million tons by 1985 and during the 12th Five-Year Plan -- to 2.05 million tons.

Such growth in the production of grain and other farming products will be achieved mainly by raising the yields. In 1985, the plans call for the grain crop yield to be raised to 23 quintals and in 1990 -- to 24.3 quintals, or higher than the average annual yields in 1976 to 1980 by 8.5 and 9.8 quintals respectively.

In connection with increases in the deliveries and applications of mineral fertilizers, an improvement in the overall culture of farming and the appearance of new and more winter-hardy varieties, an increase has taken place out on the grain fields in recent years in the proportion of the most productive crop -- winter wheat. Of 900,000 hectares of grain crop sowings at all categories of farms throughout the oblast, this crop occupies approximately 30 percent. Compared to an average grain crop yield in 1982 of 15.9 and in 1983 of 16.6 quintals, the winter wheat yields have been 19.7 and 21 quintals respectively. This was 8.1 and 8.7 quintals more than the figures for spring wheat.

Last year the winter wheat yield at our experimental station was 31.6 for an area of 960 hectares, with some tracts furnishing 65 quintals. More than 35 quintals of winter wheat were obtained on the average by the sovkhoses Krasnyy Kolos in Lipetskiy Rayon, Petrovskiy in Dobrinskiy Rayon, Proletariy in Izvalkovskiy Rayon, the Kolkhoz imeni Kirov in Lev-Tolstovskiy Rayon and by many other farms. But this is not the maximum limit. The potential productivity of regionalized varieties of Mironovskaya-808 and Lgovskaya-77 is 60-70 quintals per hectare.

One of the most effective means for raising the grain crop yields and increasing grain production is that of introducing into production operations the intensive technology for the cultivation of winter wheat. This technology is based upon the use of new, highly productive and lodging resistant varieties, achieving a neutral soil acidity and a balanced nutrient content in the soil, split applications of optimum dosages of nitrogen fertilizers during the growing season, the use of retardants and upon integrated protection for plants against pests, diseases and weeds. In the process, the plans call for the timely and high quality carrying out of all agrotechnical operations.

In order to achieve the required quality and uniformity in applications of top dressings and pesticides during the various phases of crop development, use is made of a permanent technological tract, along which the units move throughout the entire duration of the crop-tending period -- from early spring to the commencement of heading. The width of this track conforms to the plant wheel width for the RUM-5 and IRMG-4 machines for applying mineral fertilizers -- 1,800 millimeters. The track of the units used for treating crops with the TUR preparation, herbicides and fungicides is established for such a width.

Last year, winter wheat was cultivated using the new technology on 50 hectares at our experimental station. The grain met the standards for strong wheats and its gluten content was 29.3 percent. Using this technology, a yield of 52 quintals was obtained from fields of the Zavety Iliche Kolkhoz in Lipetskiy Rayon.

Taking into account the importance attached to procuring high quality grain for satisfying the oblast's requirements, the oblast party committee and the oblast executive committee adopted a special decree concerning the production of strong wheats for food purposes. In turn, the agricultural administration assigned an annual task to each rayon. And this year the scientific-production experiment in use of the intensive technology for winter wheat cultivation, on the basis of a permanent track, was carried out at 64 kolkhozes and sovkhoses in 15 rayons on an overall area of 10,000 hectares. The farms were assigned the

task of obtaining a programmed yield of 50-60 quintals of winter wheat from each hectare, with a crude gluten content of more than 28 percent and protein not lower than 14 percent.

A considerable amount of work was performed during the course of carrying out the experiment. First of all, a determination was made regarding the tracts to be used for cultivating winter wheat using the industrial technology: soil samples were taken for the purpose of computing the mineral fertilizer dosages for the programmed yield, agrochemical passports were prepared and a phyto-sanitary inspection of each field was carried out. The latter measure made it possible to carry out in a systematic manner a system of measures aimed at providing protection against weeds, diseases and pests.

In each rayon, groups were created for the purpose of exercising control and furnishing practical assistance in the various areas in connection with the introduction of the new technology. These groups consisted mainly of specialists from the agricultural administration of the oblast executive committee and other services and scientific workers from the oblast's agricultural experimental station.

We developed measures and issued recommendations concerned with use of the intensive technology for cultivating winter wheat and we prepared technological charts for each farm.

In the oblast school of the agricultural administration, training was provided for the leaders and chief specialists of kolkhozes, sovkhozes and rayon services and for workers attached to public organizations. Seminars were conducted at leading farms on soil preparation for the sowing of winter crops, applying organic and mineral fertilizers, carrying out tissue and leaf diagnostic work and on achieving efficient use of equipment. Senior scientific worker and Candidate of Agricultural Sciences G.N. Karasev was tasked with providing methodological direction for the scientific-production experiment. The oblast agricultural administration, the council of the oblast agroindustrial association and the CPSU oblast executive committee and oblast committee are exercising constant control over the manner in which the new technology is being mastered.

The intensive methods for cultivating winter wheat on a large scale require not only reorganization of the technological process but also changes in the attitude of the farm and RAPO /rayon agroindustrial association/ specialists and leaders towards this important problem. We have fine varieties and the required equipment and yet the level of our farming culture is still inadequate.

In view of the fact that clean fallow is the best predecessor crop arrangement for winter wheat, the oblast station for the use of chemical processes has undertaken to exercise constant control over the organization of work concerned with complete agrochemical inspections of the fallow land. In 1983, such work was carried out on more than 75,000 hectares. In the future, all fallow tracts of land will be serviced by the resources of Selkhozkhimiya.

Workers attached to the oblast and rayon plant protection stations must also devote special attention to the task of mastering the new technology. Reorganization work is also required by other agricultural services.



For a period of 2 years now, we have been engaged in introducing into operations the intensive technology for the cultivation of winter wheat and we have accumulated a definite amount of experience. The predecessor crop arrangements, varieties, fertilization system and the optimum periods for carrying out all agrotechnical measures have been clearly defined. The system of domestically produced machines is making it possible to carry out all technological processes, with the requirements of each crop being taken into consideration.

An analysis of the winter wheat sowings grown this year using the intensive technology has revealed indisputable advantages compared to the conventional method. Thus, at an experimental-production farm of our station, 409 productive stalks of Lgovskaya-77 wheat formed -- 189 more than under the control conditions. The length of an ear was greater by 1.9 and the height of the plants -- by 8.9 centimeters. The number of grains in an ear increased by 10.9 and the yield was raised by 13.2 quintals. It amounted to 37.5-39 quintals. At the Krasnyy Kolos Sovkhoz, Mironovskaya-808 also surpassed this same variety in terms of all parameters when the intensive technology was employed, but when cultivated using the conventional technology weight of the grain in an ear was greater by 0.6 grams, the length of an ear -- by 1.5 centimeters and the number of grains -- by 2. Similar results were obtained at a majority of the oblast's farms.

It bears mentioning that this year, owing to unfavorable weather conditions (the autumn supplies of productive moisture amounted to 55 percent of the norm and the precipitation which fell in April and May amounted to only 20 percent of the average established over a period of many years), the yield turned out to be lower than the computed figure -- only 20-35 quintals. Nevertheless, it was higher by more than twofold than that for the remaining fields. The Dankov sovkhozes Kudryavshinskiy and Verkhne-Donskoy obtained 43 and 45 quintals from 63 and 70 hectares respectively, the Volovskiy XX Partsyezd Kolkhoz obtained 37 quintals from each of 100 hectares and the Zavety Ilich Kolkhoz in Lipetskiy Rayon -- 36.5 quintals from each of 350 hectares. The grain obtained from the entire area had a gluten content of 29.9 percent and on farms in Gyzazinskiy, Usmanskiy and Lipetskiy rayons -- 31-33 percent and protein -- from 14.95 to 17.95 percent. The grain meets the requirements of the GOST /state standard/ for strong and valuable wheat, a fact which is of special importance to the central chernozem zone.

What are the principal elements of the intensive technology for the cultivation of winter wheat?

As already pointed out, the best predecessor crop arrangement for it is clean and bare fallow. The fields set aside for fallow are scuffled (to 6-8 cm) in advance. High quality in the principal mouldboard tilling (22-25 cm) is achieved through the use of PN-8-35m PLP-6-35, PN-4-40 and PYa-3-35 plows, in combination with PVR-3.5 and PVR-2.3 attachments. In the absence of these attachments, the plows are ganged with a toothless drag harrow and ring-lug rollers. During plowing, the ridges and furrows are leveled off in a thorough manner. This work is necessarily combined with the application of organic fertilizer (40 tons per hectare).

The spring-summer working of fallow consists of four cultivations: the depth of the first is 12-14 cm, the next two are reduced by 4-5 cm and the pre-sowing



cultivation -- by 6-8 cm. For carrying out this work use is made of all types of cultivator-sweeps, multiple unit AKP-2.5 assemblies, KPE-3.8 cultivators and in their absence -- row cultivators with working organs.

On a field prepared for sowing, there must not be more than 80 percent clumps ranging in size from 1 to 5 cm (mainly 1-1.5 cm). Clumps larger than 10 cm are not tolerated. The depth of loosening may deviate by only a centimeter. The surface is leveled off at an angle to the direction of plowing and with the covering over of adjacent passes (to 15-20 cm).

The sowing is carried out during the best periods using large, uniform 1st class seed of the sowing standard, that was treated with Granozan jointly with the TUR preparation. It is carried out using DT-75 and T-74 tractors ganged with three SZU-3.6 or CZP-3.6 (S-11 or SP-16 hitch) sowing machines. Following a pass by a tractor, unsown strips 450 mm in width remain after the caterpillar tracks. For this reason, two drill coulters -- 6 and 7; 18 and 19 -- on the middle sowing machine opposite the caterpillar tracks of the tractor are disconnected. In the seed box, they are covered by metal or wooden lids. With such a sowing system, the drill coulters 8 and 9; 16 and 17 follow in the trace of the caterpillar tracks.

Sowing operations based upon the use of a permanent track can also be carried out using a single sowing assembly with a Belarus tractor. Towards this end, its track is established at 1,800 mm and on the sowing machine the drill coulters of the unit 6 and 7; 18 and 19, which follow in the track of the wheels, are disconnected.

A maximum yield of winter wheat can be obtained only from well-fertilized fields characterized by a neutral reaction of the soil solution ( $\text{pH} = 6.5-7$ ). For its neutralization, use is made of lime materials (4.5-5 tons per hectare), which are applied at the time of the principal cultivation.

Prior to applying fertilizers, soil samples are taken (1 sample from every 10 hectares, from 10 holes in the 0-20 cm layer) for the purpose of determining the nutrient content and acidity level. Based upon the data obtained from this inspection and the plant requirements, the norms for applying mineral fertilizers by elements are computed. In order to obtain a 70 quintal yield under our conditions, the formation of a quintal of grain requires 2.3 kg of nitrogen, 2.1 of phosphorus and 1.3 kilograms of potassium.

In accordance with the method employed for the agrochemical cultivation of fields, phosphorus and potassium fertilizers are applied in a complete dosage during the plowing of fallow. For this year's harvest, it amounted to  $\text{P}_{204}\text{K}_{89}$ .

A peculiarity of the intensive cultivation of winter wheat is a split application of nitrogen during the growing season for the plants.

The first spring top dressing ( $\text{N}_{30}$ ) is furnished during the tillering phase. The second -- the principal one ( $\text{N}_{80}$ ) -- is furnished at the commencement of the shooting phase, when the first stalk node begins to emerge. The third ( $\text{N}_{30}$ ) and fourth (the same dosage) are applied during the period of heading and grain formation, with the results of tissue and leaf diagnosis being taken into account.

For applying top dressings to the crops use is made of RUM-5 and IRMG-4 machines ganged with Belarus tractors, which move along the technological track.

During the crop-tending campaign, importance is attached to the timely and high quality carrying out of an integrated system of measures for protecting the plants against pests, diseases and weeds. The crops are treated with herbicides and other preparations using FOU-02 and OPSh-15 machines. The plant track of the OPSh-15 machine, which is 1,350 mm, is expanded to 1,800 mm. A special attachment is employed for this purpose; it lengthens the semiaxle of the sprayer.

During the tillering period, the crops are treated with 2,4-D herbicides (1.5 kg per hectare) in the mixture: Dialen (2.5 kg) + Lontrel (0.3 kg). Fundazol (0.5 kg per hectare) is employed against snow mould in the autumn and Bayleton (0.5 kg) is used upon the appearance of powdery mildew, brown rust and root rots prior to the forming of the grain. At the end of tillering and during the stem growth phase, the campaign against overwintered bugs, stink bugs and their larvae, grain aphids, Swedish and Hessian flies and thrips is continued. The TUR preparation (4 kg per hectare) is used for preventing the lodging of wheat. During the phase of milky ripeness, the crops are treated against the larvae of stink bugs and corn weevils (Metation and Vofatox -- 1 kg per hectare).

The harvesting work is carried out using mainly the two stage method, with a grain moisture content of not more than 30 percent. The quality of the grain must be determined, with commodity batches being shipped to the grain receiving points based upon this quality.

In conformity with scientifically sound farming systems, 413,800 hectares of winter crops were sown throughout the oblast during the autumn in behalf of the harvest for the final year of the five-year plan. The new technology will be used on all of the fallow fields, which have been expanded to 130,000 hectares. This is being done in order to increase the production of strong wheats and to obtain on the average 50-60 quintals of grain per hectare.

The rapid mastering of the intensive technology for the cultivation of winter wheat will make it possible for the Lipetsk farmers to multiply their contribution towards augmenting the country's grain resources and implementing the Food Program.

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## TILLING AND CROPPING TECHNOLOGY

### ELEMENTS OF INTENSIVE TECHNOLOGY FOR GROWING WINTER WHEAT

Saratov STEPNIYYE PROSTORY in Russian No 4, Apr 85 pp 18-19

/Article by I.V. Artemov, director of the Lipetsk Oblast Agricultural Experimental Station: "From An Experiment To Extensive Use"/

/Text/ The Lipetsk Oblast Agricultural Experimental Station was the first in the country to introduce into operations on its fields the intensive technology for the cultivation of winter crops. The task at the present time consists of commencing the use of this technology for the cultivation of spring grain crops.

This article is being published at the request of readers and it provides a discussion of the principal elements constituting the intensive technology.

One of the most effective means for raising the grain crop yields and increasing grain production is that of introducing into production operations the intensive technology for the cultivation of winter wheat. This technology is based upon the use of new, highly productive and lodging resistant varieties, achieving a neutral soil acidity and a balanced nutrient content in the soil, split applications of optimum dosages of nitrogen fertilizers during the growing season, the use of retardants and upon integrated protection for plants against pests, diseases and weeds. In the process, the plans call for the timely and high quality carrying out of all agrotechnical operations.

In order to achieve the required quality and uniformity in applications of top dressings and pesticides during the various phases of crop development, use is made of a permanent technological tract, along which the units move throughout the entire duration of the crop-tending period -- from early spring to the commencement of heading. The width of this track conforms to the plant wheel width for the RUM-5 and 1RMG4 machines for applying mineral fertilizers -- 1,800 millimeters. The track of the units used for treating crops with the TUR preparation, herbicides and fungicides is established for such a width.

In 1983, winter wheat was cultivated using the new technology on 50 hectares at our experimental station. The grain met the standards for strong wheats and its gluten content was 29.3 percent. Using this technology, a yield of 52 quintals was obtained from fields of the Zavety Iliche Kolkhoz in Lipetskiy Rayon.

Taking into account the importance attached to procuring high quality grain for satisfying the oblast's requirements, the oblast party committee and the oblast executive committee adopted a special decree concerning the production of strong wheats for food purposes. In turn, the agricultural administration assigned an annual task to each rayon. And this year the scientific-production experiment in use of the intensive technology for winter wheat cultivation, on the basis of a permanent track, was carried out at 64 kolkhozes and sovkhoses in 15 rayons on an overall area of 10,000 hectares. The farms were assigned the task of obtaining a programmed yield of 50-60 quintals of winter wheat from each hectare, with a crude gluten content of more than 28 percent and protein -- not lower than 14 percent.

A considerable amount of work was performed during the course of carrying out the experiment. First of all, a determination was made regarding the tracts to be used for cultivating winter wheat using the industrial technology: soil samples were taken for the purpose of computing the mineral fertilizer dosages for the programmed yield, agrochemical passports were prepared and a phyto-sanitary inspection of each field was carried out. The latter measure made it possible to carry out, in a systematic manner, a system of measures aimed at providing protection against weeds, diseases and pests.

In each rayon, groups were created for the purpose of exercising control and furnishing practical assistance in the various areas in connection with the introduction of the new technology. These groups consisted mainly of specialists from the agricultural administration of the oblast executive committee and other services and scientific workers from the oblast's agricultural experimental station.

We developed measures and issued recommendations concerned with use of the intensive technology for cultivating winter wheat and we prepared technological charts for each farm.

In the oblast school of the agricultural administration, training was provided for the leaders and chief specialists of kolkhozes, sovkhoses and rayon services and for workers attached to public organizations. Seminars were conducted at leading farms on soil preparation for the sowing of winter crops, applying organic and mineral fertilizers, carrying out tissue and leaf diagnostic work and on achieving efficient use of equipment. Senior scientific worker and Candidate of Agricultural Sciences G.N. Karasev was tasked with providing methodological direction for the scientific-production experiment. The oblast agricultural administration, the council of the oblast agroindustrial association and the CPSU oblast executive committee and oblast committee are exercising constant control over the manner in which the new technology is being mastered.

The intensive methods for cultivating winter wheat on a large scale require not only reorganization of the technological process but also changes in the attitude of the farm and RAPO /rayon agroindustrial association/ specialists and leaders towards this important problem. We have fine varieties and the required equipment and yet the level of our farming culture is still inadequate.

In view of the fact that clean fallow is the best predecessor crop arrangement for winter wheat, the oblast station for the use of chemical processes has



undertaken to exercise constant control over the organization of work concerned with complete agrochemical inspections of the fallow land. In 1983, such work was carried out on more than 75,000 hectares. In the future, all fallow tracts of land will be serviced by the resources of Selkhozkhimiya.

Workers attached to the oblast and rayon plant protection stations must also devote special attention to the task of mastering the new technology. Reorganization work is also required by other agricultural services.

For a period of 2 years now, we have been engaged in introducing into operations the intensive technology for the cultivation of winter wheat and we have accumulated a definite amount of experience. The predecessor crop arrangements, varieties, fertilization system and the optimum periods for carrying out all agrotechnical measures have been clearly defined. The system of domestically produced machines is making it possible to carry out all technological processes, with the requirements of each crop being taken into consideration.

An analysis of the winter wheat sowings grown this year using the intensive technology has revealed indisputable advantages compared to the conventional method. Thus, at an experimental-production farm of our station, 409 productive stalks of Lgovskaya-77 wheat formed --180 more than under the control conditions. The length of an ear was greater by 1.9 and the height of the plants -- by 8.9 centimeters. The number of grains in an ear increased by 10.9 and the yield was raised by 13.2 quintals. It amounted to 37.5-39 quintals. At the Krasnyy Kolos Sovkhoz, Mironovskaya-808 also surpassed this same variety in terms of all parameters when the intensive technology was employed, but when cultivated using the conventional technology (weight of the grain in an ear was greater by 0.6 grams, the length of an ear -- by 1.5 centimeters and the number of grain -- by 2). Similar results were obtained at a majority of the oblast's farms.

It bears mentioning that this year, owing to unfavorable weather conditions (the autumn supplies of productive moisture amounted to 55 percent of the norm and the precipitation which fell in April and May amounted to only 20 percent of the average established over a period of many years), the yield turned out to be lower than the computed figure -- only 20-35 quintals. Nevertheless, it was higher by more than twofold than that for the remaining fields. The Dankov sovkhoses Kudryavshinskiy and Verkhne-Donskoy obtained 43 and 45 quintals from 63 and 70 hectares respectively, the Volovskiy XX Partsyezd Kolkhoz obtained 37 quintals from each of 100 hectares and the Zavety Ilich Kolkhoz in Lipetskiy Rayon -- 36.5 quintals from each of 350 hectares. The grain obtained from the entire area had a gluten content of 29.9 percent and on farms in Gryazinskiy, Usmanskiy and Lipetskiy rayons -- 31-33 percent and protein -- from 14.95 to 17.95 percent. The grain meets the requirements of the GOST /state standard/ for strong and valuable wheat, a fact which is of special importance to the central chernozem zone.

What are the principal elements of the intensive technology for the cultivation of winter wheat?

As already pointed out, the best predecessor crop arrangement for it is clean and bare fallow. The fields set aside for fallow are scuffled (to 6-8 cm) in



advance. High quality in the principal mouldboard tilling (22-25 cm) is achieved through the use of PN-8-35m PLP-6-35, Pn-4-40 and PYa-3-35 plows, in combination with PVR-3.5 and PVR-2.3 attachments. In the absence of these attachments, the plows are ganged with a toothless drage harrow and ring-lug rollers. During plowing, the ridges and furrows are leveled off in a thorough manner. This work is necessarily combined with the application of organic fertilizer (40 tons per hectare).

The spring-summer working of fallow consists of four cultivations: the depth of the first is 12-14 cm, the next two are reduced by 4-5 cm and the pre-sowing cultivation -- by 6-8 cm. For carrying out this work use is made of all types of cultivator-sweeps, multiple unit AKP-2.5 assemblies, KPE-3.8 cultivators and in their absence -- row cultivators with working organs.

On a field prepared for sowing, there must not be more than 80 percent clumps ranging in size from 1 to 5 cm (mainly 1-1.5 cm). Clumps larger than 10 cm are not tolerated. The depth of loosening may deviated by only a centimeter. The surface is leveled off at an angle to the direction of plowing and with the covering over of adjacent passes (to 15-20 cm).

The sowing is carried out during the best periods using large, uniform 1st class seed of the sowing standard, that was treated with Granozan jointly with the TUR preparation. It is carried out using DT-75 and T-74 tractors ganged with three SZU-3.6 or CZP-3.6 (S-11 or SP-16 hitch) sowing machines. Following a pass by a tractor, unsown strips 450 mm in width remain after the caterpillar tracks. For this reason, two drill coulters -- 6 and 7; 18 and 19 -- on the middle sowing machine opposite the caterpillar tracks of the tractor are disconnected. In the seed box, they are covered by metal or wooden lids. With such a sowing system, the drill coulters 8 and 9; 16 and 17 follow in the trace of the caterpillar tracks.

Sowing operations based upon the use of a permanent track can also be carried out using a single sowing assembly with a Belarus tractor. Towards this end, its track is established at 1,800 mm and on the sowing machine the drill coulters of the unit 6 and 7; 18 and 19, which follow in the track of the wheels, are disconnected.

A maximum yield of winter wheat can be obtained only from well fertilized fields characterized by a neutral reaction of the soil solution (pH = 6.5-7). For its neutralization, use is made of lime materials (4.5-5 tons per hectare), which are applied at the time of the principal cultivation.

Prior to applying fertilizers, soil samples are taken (1 sample from every 10 hectares, from 10 holes in the 0-20 cm layer) for the purpose of determining the nutrient content and acidity level. Based upon the data obtained from this inspection and the plant requirements, the norms for applying mineral fertilizers by elements are computed. In order to obtain a 70 quintals yield under our conditions, the formation of a quintal of grain requires 2.3 kg of nitrogen, 2.1 of phosphorus and 1.3 kilograms of potassium.

In accordance with the method employed for the agrochemical cultivation of fields, phosphorus and potassium fertilizers are applied in a complete dosage during the plowing of fallow. For this year's harvest, it amounted to P<sub>204</sub>K<sub>99</sub>.

A peculiarity of the intensive cultivation of winter wheat is a split application of nitrogen during the growing season for the plants.

The first spring top dressing ( $N_{30}$ ) is furnished during the tillering phase. The second -- the principal one ( $N_{80}$ ) -- is furnished at the commencement of the shooting phase, when the first stalk node begins to emerge. The third ( $N_{30}$ ) and fourth (the same dosage) are applied during the period of heading and grain formation, with the results of tissue and leaf diagnosis being taken into account.

For applying top dressings to the crops, use is made of RUM-5 and 1RMG-4 machines ganged with Belarus tractors, which move along the technological track.

During the crop-tending campaign, importance is attached to the timely and high quality carrying out of an integrated system of measures for protecting the plants against pests, diseases and weeds. The crops are treated with herbicides and other preparations using POU-02 and OPSh-15 machines. The plant track of the OPSh - 15 machine, which is 1,350 mm, is expanded to 1,800 mm. A special attachment is employed for this purpose; it lengthens the semiaxle of the sprayer.

During the tillering period, the crops are treated with 2.4-D herbicides (1.5 kg kg per hectare) in the mixture: Dialen (2.5 kg) + Lontrel (0.3 kg). Fundazol (0.5 kg per hectare) is employed against snow mould in the autumn and Bayleton (0.5 kg) is used upon the appearance of powdery mildew, brown rust and root rots prior to the forming of the grain. At the end of tillering and during the stem growth phase, the campaign against overwintered bugs, stink bugs and their larvae, grain aphids, Swedish and Hessian flies and thrips is continued. The TUR preparation (4 kg per hectare) is used for preventing the lodging of wheat. During the phase of milky ripeness, the crops are treated against the larvae of stink bugs and corn weevils (Metation and Vofatox -- 1 kg per hectare).

The harvesting work is carried out using mainly the two stage method, with a grain moisture content of not more than 30 percent. The quality of the grain must be determined, with commodity batches being shipped to the grain receiving points based upon this quality.

In conformity with scientifically sound farming systems, 413,800 hectares of winter crops were sown throughout the oblast during the autumn in behalf of the harvest for the final year of the five-year plan. The new technology will be used on all of the fallow fields, which have been expanded to 130,000 hectares. This is being done in order to increase the production of strong wheats and to obtain on the average 50-60 quintals of grain per hectare.

The rapid mastering of the intensive technology for the cultivation of winter wheat will make it possible for the Lipetsk farmers to multiply their contribution towards augmenting the country's grain resources and implementing the Food Program.

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## TILLING AND CROPPING TECHNOLOGY

### USE OF INTENSIVE TECHNOLOGY IN ALTAY KRAY

Omsk ZEMLYA SIBIRSKAYA, DALNEVOSTOCHNAYA in Russian No 11, Nov 85 pp 10-12

[Article by D.Ye. Nartov, chief of the Production Administration for Agriculture of the Altay Kray Executive Committee: "Intensive Fields of the Altay"]

[Text] A traveling editorial board of the journal ZEMLYA SIBIRSKAYA, DALNEVOSTOCHNAYA on fields in the Altay Kray.

In speaking before a meeting of the party-economic aktiv in the city of Tselinograd, the General Secretary of the CPSU Central Committee M.S. Gorbachev emphasized: "Satisfaction of the requirements for grain, both bread and forage grain, will be determined to a large degree by the contributions made by Kazakhstan, the krays and the oblasts of Siberia and the Urals. The agricultural workers in the twice decorated Altay Kray are well aware of this circumstance. Similar to all Soviet people, they are striving on the basis of shock work to prepare for the approaching 27th Congress of the Communist Party of the Soviet Union, to fulfill the tasks for 1985 and the 11th Five-Year Plan for purchases of field and farm products and in this manner to make a worthy contribution towards implementing the country's Food Program. A maximum amount of attention is being given to increasing grain production in every possible way -- a main resource of our state.

The socialist obligations for this year call for an increase of 10 percent in the gross output of agriculture. A grain crop yield of not less than 17.5 quintals per hectare and a production of 7,130,000 tons must be achieved, with 3.8 million tons being sold to the state, including not less than 1 million tons of strong, durum and valuable varieties of wheat.

These tasks, in the opinion of the kray's leaders, the leaders of rayons and farms and rank and file machine operators with whom we held discussions, are fully within our capability. Each year the state furnishes agriculture with a great amount of assistance. This serves to strengthen the logistical base of the sovkhoses and kolkhozes, to improve their economies and also to improve the working and living conditions and the material and cultural levels of the agricultural workers. Last year alone, as a result of an increase in the purchase prices, the kray's farms realized 416 million rubles worth of profit. At the present time, the average profitability in agriculture is 27 percent.

A great amount of importance is being attached throughout the kray to the intensification of farming and to the introduction into production on an

extensive scale of the achievements of science, leading practice and scientific-technical progress. From year to year, fine results are being achieved by the kolkhozes Put K Kommunizmu in Sovetskiy, imeni Shumakov in Zmeinogorskiy and Progress in Petropavlovskiy, by the sovkhoses Srostinskiy in Biyskiy and the Altayskiy in Smolenskiy rayons and by other farms. The raising of backward and average farms to the level of leading collectives represents the true path for increasing the contribution to be made by the kray's workers towards the country's food balance.

We held several interviews during our trips, the main theme of which concerned methods for increasing the production and procurements of high quality Altay grain.

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An analysis of the grain crop yields in the Altay over the past 85 years has shown that they exceeded 13 quintals per hectare on 11 occasions and on one occasion -- 19.9 quintals per hectare. During the remaining times, the yields fluctuated from 1.6 to 12 quintals. It is especially vexing to note that land plowed by a farmer during the 1920's using a wooden plow produced the same amount of grain as that being obtained by a modern worker, whose power-worker ratio has increased to 38 horsepower.

Naturally, such a situation is anything but satisfactory. Thus the CPSU Central Committee and the USSR Council of Ministers have this year tasked the kray's grain growers with mastering the cultivation of strong and durum varieties of wheat using the intensive technology on an area of 1.2 million hectares and in this manner producing 550,000-600,000 additional tons of grain from a yield of 19.5-20 quintals per hectare. The program for the intensification of farming is the only true path to be followed, a call of the times.

We had some stockpiles for carrying out this task. For example, scientifically sound zonal soil-protective farming systems were developed and mastered during the 1981-1984 period. Taking into account local peculiarities, soil-protective crop rotation plans with brief rotations were introduced into operations at each sovkhos and kolkhoz and they were based upon the use of clean fallow fields. The structure of the area under crops was made to conform to the recommendations. A system of soil-protective and moisture-conserving principal and pre-sowing soil cultivation was introduced on all of the arable land.

Leading methods for labor organization and wages are actively being introduced into field crop husbandry operations. Exactly what these methods are accomplishing can be ascertained by monitoring the example of Smolenskiy Rayon, where all of the arable land is being worked by brigades and teams operating on a collective contract. Compared to the 10th Five-Year Plan, labor productivity here has increased by 29 percent and the average annual gross output volume by 18 percent. Each year the farms earn more than 10 million rubles worth of profit.

The introduction of the intensive technology began with the training of personnel: a requirement existed first of all for thorough knowledge of the



work. Such training was undertaken by staff workers of the kray party committee and the kray executive committee and the first secretaries of rayon party committees and rayon executive committees. In the kray agricultural administration, with the active participation of our specialists and scientists, a 48 hour program of training that was approved by the RSFSR Ministry of Agriculture was undertaken by the chiefs of rayon agricultural administrations, specialists, sovkhoz and kolkhoz leaders and the chairmen of rayon associations of Selkhozkhimiya. At the rayon administration level, a course of instruction was undertaken by specialists, brigade leaders, team leaders and machine operators in connection with the departure of leading scientists and specialists.

We began the practical introduction of the intensive technology with the production of the equipment needed for it -- equipment for sorting, crushing, loading and applying mineral fertilizers, boom sprayers and so forth. As a result of the efforts of our loyal partner Selkhoztekhnika and the kray's industrial enterprises, 117,000 Altay coulters were produced within a brief period of time for all of the available stubble sowing machines for inclined-belt applications of mineral fertilizers. They were all used on a strictly scientific basis, thus ensuring fractional nutrition for the plants.

Under the slogan "Exemplary tending of the crops," the party, soviet and economic organs evidenced concern for ensuring that the work tension out on the fields did not decline with the completion of the sowing work, as often happened during past years. The fate of the harvest was greatly dependent upon this. Agronomic methods well known to science and practical work were employed for combating weeds and pests. In those areas where they did not produce the desired results, use was made of chemical means for protecting plants. The wheat sowings for a second crop following fallow, on an area of 484,000 hectares, were treated with herbicides. The TUR preparation was employed on especially fertile lands for the purpose of preventing lodging of the crops.

And finally the most important period commenced -- the harvesting of the crop. We always expend a maximum amount of effort and energy during this period, especially when inclement weather is involved. The Altay farmers are accustomed to this: there is no such thing as an easy harvest in Siberia. All of the material and human resources were mobilized in behalf of bringing in the grain. Out into the field went 25,000 combines well-repaired, sealed, equipped for work with any type of grain. All mechanics were assembled into harvest transport detachments and links. This was a tradition with us. Time was no factor.

For transporting the grain from the combines to the threshing floors and back to the grain receiving enterprises with full loads, use was made of more than 40,000 motor vehicles, including 11,200 which were provided by other oblasts throughout the country in the form of assistance. In the interest of economizing in the use of transport equipment, extensive use was made of tractor trailers, storage bins and intermediate threshing floors. In the kray and rayon centers for coordinating grain shipments to the state granaries, staffs created especially for this purpose carried out their work in an efficient manner.

Mention must necessarily be made here of a number of as yet unsolved problems which the farmers in our zone, and possibly those in other zones, encountered during the introduction of the intensive technology on an extensive scale. First of all, we have considerable and sound grievances against the Ministry of



Tractor and Agricultural Machine Building -- there is a very serious shortage of equipment. It thus happens that all of the machines and equipment must be made practically by hand, in a low quality manner and at great expense. Let us take a coulter. Its production in Selkhoztekhnika workshops costs 15 rubles (the cost for the kray as a whole -- 2 million rubles). On sandy soils, it can be used only for the sowing of 50-60 hectares. Nor is the situation any better in the case of some other implements -- crushers, graders, sprayers and so forth.

There is an acute shortage of mineral fertilizers and certainly we are pleased when an additional amount becomes available. But if we are using a large trailer, we expect to be able to apply at least 180-200 kilograms of active agent per hectare. And this year the plants have undersupplied the kray in the amount of 20,000 tons. The mineral fertilizer delivery schedules are constantly being disrupted.

Considerable success was realized this year in connection with the extensive introduction of the intensive technology for the cultivation of strong and durum wheats and yet a great amount of work still remains to be carried out. And the work was not in vain. A fine harvest was obtained. The planned increase in grain was obtained from such fields. This in turn allows us to carry out the first commandment of a grain grower. The conclusion can now be drawn that the program for farming intensification is the only true path to be followed. It has become the main path for the Altay farmers.

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## TILLING AND CROPPING TECHNOLOGY

### INTENSIFIED AGROTECHNOLOGY IMPLEMENTED IN VORONEZH OBLAST

Moscow PRAVDA in Russian 31 Oct 85 p 3

[Article by PRAVDA correspondent A. Starukhin in Voronezh Oblast: "A Measure for the Grain Crop: Postscript to the Harvest"]

/Text/ Another autumn, another result. And again it can be said that the result was not a pleasing one. Only 40 percent of the grain volume planned for Voronezh Oblast was sold to the state. And in recent years the average grain yield has decreased by more than 4 quintals. If you please, there are no indicators worse than those for the central chernozem zone.

Poor weather is listed as one of the factors preventing the Voronezh grain growers from obtaining full-weight ears. It is also a factor which must be reckoned with. But not in the sense of "writing off" the failures, but rather for the purpose of achieving the planned goals despite inclement weather. We are convinced that not all of the obstacles have been removed from the planned path.

In the eastern part of the oblast, in the Kamennaya Steppe region, fine and stable yields are being obtained under cover of a forest strip. Hundreds of kilometers to the south, at Kalach, they are being obtained through use of the soil-protective system of farming. And for a certain period of time now, another agrotechnical "miracle" has been making its presence known -- the intensive technology for wheat and rye cultivation.

A crude comparison has revealed that this technology has placed an agronomist and an agricultural machine operator on the same level with an engineer or plant worker. It makes it possible to program yields. Only all of the technological parameters without exception must be maintained. However, by no means is every individual to whom a field is entrusted capable of "maintaining all of them without exception."

The village is referred to as Borshchevskiye Peski. Even in the face of autumn rainfall, the arable land at the Iskra Kolkhoz can be seen glistening over a great distance. It is difficult land. More organic material is required here and the need for an intelligent alternation of crops is more important here than anywhere else. The fallow land must also be maintained in good condition.

"Our results were as follows," stated the kolkhoz chairman N. Pshenichnikov "the grain was the weakest in Ertil'skiy Rayon and our beets -- the most productive. Is this not a mystery? The same people were cultivating both crops. It was simply a matter of the crop rotation plan not being closed."

It is difficult to close a crop rotation plan if more than one half of the fields are occupied by grain crops, yes cumbersome, 500 hectare "squares" of sugar beets and sunflowers. And it turns out that a fine predecessor crop arrangement for wheat is lost, as in a lottery. And tell me, where was the fallow? One year ago an attempt was made at the kolkhoz to allow 500 hectares to lie fallow. Nothing happened.

It turned out that the oblast was following a program aimed at ensuring the use in all areas of scientifically sound farming systems, not those considered to be needed and mandatory for this work. But today it is difficult to find a corner in which a scientific control over farming is being carried out from beginning to end. Last year the Voronezh farmers finally left almost 300,000 hectares of fallow. The first time! This fact was certified in April and in May a command was issued: use 120,000 fallow hectares for corn.

What happened? Serious fears arose concerning the feed -- it suddenly appeared that there would be no hay nor straw. The sharp tactical zigzag turned out to be a miscalculation. In any case, there would be sufficient feed resources. And the oblast's crop rotation plans disintegrated; they must now be restored immediately. In addition, if we make a judgment based upon this current year, a hectare of fallow land furnished an increase of 7.4 quintals compared to the usual method. Hence, it would appear that 900,000 quintals of grain were eliminated from the harvest!

The oblast agricultural administration now realizes that a mistake was committed. There are those who reassure themselves by maintaining that in any case the fallow would have been worked poorly. There is a particle of truth in this claim. Thus, serious attention must be given to the work being carried out with "sanitary fields." Or there is still another problem. Nobody is legalizing the soil protective system of farming in the oblast.

We attempted to learn from the deputy chief of the oblast agricultural administration I. Bondarenko on what area it was employed. Ivan Semenovich replied: "We are working the land with sweeps in all areas where the conditions require such action."

Is this so? We still recall the zonal seminar on the use of intensive technologies for the cultivation of agricultural crops, held in July in Lipetsk. A representative of the Voronezh workers referred to a shortage of sweeps. But if this was the only reason, would it not be possible to accelerate a solution for the problem using the resources of one's own industrial enterprises?

But, as the saying goes, trust for a word spoken, a measure for grain and accounting for money. At the Vostok Kolkhoz in Vorobyevskiy Rayon, after mastering the use of the non-plow system over a considerable portion of the areas, a comparison was made of the results. And now an even greater preference is being displayed for the new methods for working fallow. The millet yields obtained from experimental tracts -- we refer to them as such -- turned out to be higher by 2.2 quintals, peas -- by a quintal and corn bulk -- by 23 quintals.

Whether small or large, there nevertheless was an increase and at no time was a reduction in yield recorded. There was one other result of considerable importance: the expenses for each hectare worked using a sweep decreased by 20 percent. And there was an unprecedented example for the conditions found here. Over the past 28 years, the Put Lenina Kolkhoz in Kalacheyevskiy Rayon has never had a yield lower than 25 quintals. The village was fortunate in having such an agronomist as bearer of the Order of Lenin Ivan Fomich Verbitskiy, a veteran who long ago "retired" his plow. He succeeded in making the land fertile once again, land which had been subjected to erosion.

"Consider for yourself. Verbitskiy rescued both his kolkhoz and the rayon. Our city ironically was referred to as being Kalach and we do not use the new technology," stated the 1st secretary of the Kalacheyevskiy Rayon Party Committee V. Filonenko "and this autumn the rayon's yield was higher than the average for the oblast by 4.3 quintals and at a kolkhoz which is accustomed to competing a hectare furnished 32.8 quintals. Moreover, not all of our people mastered the lesson."

Not all. On the left -- the fields of the Put Lenina Kolkhoz and on the right, across the road -- those of the Kolkhoz imeni Sverdlov. The latter's yield -- 15 quintals. There is no desire to even comment upon this difference. An ear and spikelet.

Two years ago the Voronezh Oblast Party Committee and the oblast's agricultural organs were criticized sharply in PRAVDA (31 October 1983) for failing to devote proper attention to the economy, for mistakes in the selection, training and placement of kolkhoz and sovkhoz leaders and specialists, for working the land poorly and for realizing only a low return from the land.

It turns out that very little has changed since that time. And if we are discussing yields, then it should be mentioned that they dropped even lower during this period. And to say the least, this fact was not looked upon with favor during the sonal seminar for Voronezh farmers. More than 40 percent of the sowing areas in the oblast are being supplied with fertilizer in a low quality manner. Only one tenth of the sowings are being treated with chemicals in an effort to control diseases and the sowing of untreated seed is being tolerated. These constitute deviations from the accepted agricultural practices. And each such deviation results in a loss of a specific amount of grain. One clear example reflecting the quality of the work carried out on the fields: winter crops were sown last year on 776,000 hectares and only 648,000 had to be harvested. Moreover, 140,000 hectares were resown in the spring. Continuing expenses, a reduction in productivity and a shortfall amounting to many thousands of tons of grain.

One of the agronomists, in discussing the intensive technology for the cultivation of grain crops, mentioned its "cybernetics" in agricultural production. On these fields, an individual would be able to program yields. Fertilizer would be applied based upon an accurate agrochemical analysis of the soil. In conformity with the "needs" of a field, those substances which it lacks would be supplied. Here a farmer must be an agronomist with a capital A and he must also be the master of his land.

What yields did the farmers in Voronezh Oblast realize from use of the intensive technology, which is still being employed on 50,000 hectares? The average yield surpassed the return from the remaining hectares by 10 quintals.

Is this a good or poor result? It is a poor one. The new innovation makes it possible to embody any type of patriarchal plan. By absorbing far greater expenses compared to the usual method, the new technology must accordingly award a villager.

What happened on the Voronezh fields? We are obviously not in error if we state that the technology did not hold up well and since it was "mathematically" more distinct here than elsewhere or formerly, deviations were noted which were tolerated earlier.

In Kantemirovskiy Rayon, the programmed fields furnished a yield, in Rossoshanskiy Rayon their "advantage" was evaluated as an increase of 3-5 quintals and in Gribanovskiy Rayon the fields turned out to be less productive from the "track." In Anninskiy Rayon, a traveling session of the council for the oblast agroindustrial association was held following the harvest. Here it was noted that on many farms in this rayon and also in Bogucharskiy, Liskinskiy, Kashirskiy and Ertilskiy rayons the leaders and chief specialists are not familiar with the intricacies of the new technology. And, even worse, they are not studying them.

Fine examples are at hand in Voronezh Oblast. Some farms in Kamenskiy Rayon have surpassed the 50 quintal productivity level. Unfortunately, they "do not make the weather." Their number must be increased. And no additional time has been provided for accelerating this process. We often employ the phrase "human factor." It is believed that the hour is at hand for this powerful factor to play a pivotal role. In the central chernozem region, industry and agriculture in the oblast have always been considered to be economically developed and strong. By tradition, neighbors have sought to borrow upon the experience of the Voronezh workers. But in recent years, these roads have been blocked. And now the Voronezh workers are adopting the experience of others.

Pride... And where was it when the foundation for the next harvest was being established or when the fate of the state plans was being decided? Nobody wishes to start a new five-year plan already in debt.

Full-weight ears at times ripen on neighboring fields and on one's own fields -- spikelets.

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## TILLING AND CROPPING TECHNOLOGY

### IMPLEMENTATION OF INTENSIVE AGROTECHNOLOGY IN SIBERIA

Moscow SELSKAYA ZHIZN in Russian 26 Nov 85 p 2

/Article/ by V. Kiryushin, Corresponding Member of the All-Union Academy of Agricultural Sciences imeni V.I. Lenin and director of the Siberian Scientific-Research Institute of Farming and Use of Chemical Processes in Agriculture, Novosibirsk Oblast: "Lessons From the Intensive Fields of Siberia"/

/Text/ The five-year plan that is now coming to a close has been a period of high quality changes for the Siberian farmers. An increase has taken place in the differentiation of zonal agricultural complexes in conformity with the soil-climatic conditions, an optimum value has been achieved for the proportion of clean fallow and an expansion has taken place in the areas of grain forage and pulse crops and rape, especially in the northern rayons of the zone. Optimum crop rotation systems with brief rotations and a sweep and non-mouldboard system of soil cultivation have been mastered for the most part in the steppe zone, the southern forest-steppe region and on solonetz lands and the mastering of intensive technologies for the cultivation of wheat has commenced on an extensive scale.

All of this has promoted an increase in the productivity of the arable land. In particular, over the past 2 years the average grain crop yield in western Siberia has increased almost to the 16 quintal mark. Many experimental and base farms are now obtaining 25-30 quintals of grain per hectare and the Zavodoukovskoye OPKh /experimental model farm/ of the NIISKh /Scientific-Research Institute of Agriculture/ for Western Trans-Urals -- 39. Even higher results have been obtained on the experimental fields of scientific research institutes of the SO VASKhNIL /Siberian Branch of the All-Union Academy of Agricultural Sciences imeni V.I. Lenin/, where the latest variants in intensive technologies for wheat cultivation have been tested.

Thus a grain yield of 46 quintals per hectare was obtained during a production experiment carried out at the Elitnoye OPKh in Novosibirsk Oblast in connection with cultivation of the Novosibirskaya 81 wheat variety using the intensive technology and a constant technological track. This was 11 quintals higher than the variant involving use of the conventional technology, with the same level of fertilizers and traditional herbicides being used.

Beyond any doubt, accumulated experience coincides with the program for the intensive development of agriculture, as outlined in the draft basic directions

for the development of our economy. An expansion must take place throughout the region in the use of soil-protective methods for the cultivation of land and the gross yields of grain and other products must be raised considerably at each kolkhoz and sovkhoz. However, it bears mentioning that this year the wheat yields on many farms turned out to be lower than the level expected based upon the agroclimatic resources and the investments of mineral fertilizers per hectare of arable land.

The chief reason for the reduction in the effectiveness of the intensive technologies lies in the fact that they were not sufficiently mastered from an all-round standpoint and particularly with regard to the limited use of fungicides, retardants and herbicides. In a number of oblasts in Siberia, especially in Novosibirsk, Kemerovo and Tomsk oblasts, an unfavorable phytosanitary situation developed this year in the grain crop plantings and the accelerated dying off of the leaf structure of plants occurred.

At the same time, this process naturally took place in a gradual manner in plantings which were treated with fungicides and the difference in grain yields amounted to 15-20 percent. Moreover, the domestic preparation Sineb was only slightly inferior to Bayleton in terms of its effectiveness. Unfortunately, the treatment of plantings with fungicides was carried out on the farms on a limited basis.

Another and less sudden "surprise" was that of lodging of the crops. It was prevented or weakened only on a relatively small area that had been treated with the TUR preparation. The stalks of such crops were shorter by 25-30 cm and their lower internodes were thick. The plumpness of the grain turned out to be better and the losses during harvesting were less. Obviously, this experience will serve as a lesson for those who question the effectiveness of this preparation and also for those who are planning deliveries of it.

Still another conclusion can be drawn from the annual results. In addition to the weather conditions, the lodging was promoted by excessive nitrogen nutrition for the wheat following fallow -- nitrogen was applied mainly in the form of complex mineral fertilizers which were made available to the region. The reduction in the overall return from fertilization was aggravated by the fact that the plants on non-fertilized fields experienced an acute shortage of nutrients, especially nitrogen, while at the same time those on excessively fertilized tracts were lodging.

It is obvious that in a region where the arable land is poorly supplied with fertilizers, the concentration of crops for intensive technologies must be determined by the conditions dictated by the zonal farming systems. What is the essence of these requirements? Fallow predecessor crop arrangements provide the primary area for the use of intensive technologies. The use of phosphorus fertilizers following non-fallow predecessor crop arrangements in behalf of grain crops must be planned only following satisfaction of their requirements for the crop scheduled to follow the fallow. If this is not done, the mineral nitrogen and moisture accumulated in the fallow fields will not be utilized fully by the crop. Additionally, it should be stated that nitrates which are not used by the plants migrate beyond the root-inhabiting layer, a development which has been noted in recent years in the chernozem soils of Siberia and Kazakhstan, which have long been used in fallow crop rotation plans.

A relative concentration of fertilizers, primarily organic fertilizers, is considered to be highly advisable for row crops. These crops, especially corn, when cultivated using the intensive technology, become fine predecessor crops for grain crops. Such a distribution in the use of fertilizers smooths out to a considerable degree the differences in field productivity and it promotes an increase in the productivity of crop rotation plans, an improvement in the quality of the products and more efficient utilization of soil fertility.

The computation of mineral fertilizer dosages, especially nitrogen fertilizer, for wheat following non-fallow predecessor crop arrangements must be carried out taking into account not only the residual supplies of nutrients but also the soil cultivation system. Use of sweep cultivation in the northern forest-steppe region requires an application of 20-30 more kilograms of nitrogen per hectare compared to mouldboard cultivation. Additional dosages or irregular applications of fertilizer are considered to be highly undesirable.

A substantial shortcoming and one which reduces the effectiveness of grain crop cultivation in the forest-steppe zone is the use of SZS-2.1 sowing machines. The crowding of plants in rows and wide inter-row spacings, which promote the development of weeds, at times reduces to zero the merits of the anti-erosion technologies. In the forest-steppe zone, the SZS-2.1 sowing machines must be replaced by the SZS-2.1L belt sowing machines. Deliveries of these machines to Siberia must be increased sharply.

An important element is the use of pesticides for combating pests. This work is still being carried out in a very limited manner and is not being augmented by a timely diagnosis of the phytosanitary status of the crops, which must be characterized by the economic thresholds of damage caused by pests. Great opportunities for reducing the pesticide workload are being afforded by the use of a new aerosol technology developed by SibNIIKhim jointly with other institutes, based upon the use of a controlled dispersion generator created at the Institute of Chemical Kinetics and Combustion of the Siberian Branch of the USSR Academy of Sciences.

It was by no means an accident that the draft basic directions singled out the intensive technologies as an important factor for further agricultural development -- they are developing a new attitude towards the very essence of the productive process, which is becoming continuous and saturated with technological operations, despite the obsolete formula "sown - harvested." It requires a high degree of skill on the part of the individuals carrying out the work and high technological discipline and thus it promotes the restoration of order on earth. This is why importance is attached to ensuring that these technologies are mastered completely and in an organic interrelationship with improvements in the zonal farming systems. In short, as set forth in the document which we are presently discussing.

In the section dealing with an agroindustrial complex, where a discussion takes place on the use of chemical processes, the following sentence should be added: "To increase the preparation and use of organic fertilizers to 1.5 billion tons by 1990." This will place all of the work on a planned and mandatory basis.

## TILLING AND CROPPING TECHNOLOGY

### INTENSIVE USE OF CHEMICALS FOR SOIL FERTILITY IN SIBERIA

Omsk ZEMLYA SIBIRSKAYA, DALNEVOSTOCHNAYA No 11, Nov 85 pp 24-25

[Article by V. M. Belchenko, chairman of VPNO Rosselkhozkhimiya [All-Union Association of the RSFSR Council of Ministers for the Sale of Agricultural Technology, Spare Parts, Mineral Fertilizers and Other Supplies and Equipment, and for the Organization of Repair and Utilization of Machines at Kolkhozes and Sovkhozes], and first deputy minister of agriculture for the RSFSR: "In Charge of Agricultural Chemistry."

[Text] During the five years that have passed since the creation in the RSFSR of a unified specialized service for the chemicalization of agriculture, Rosselkhozkhimiya, together with kolkhozes and sovkhozes, has accumulated much experience in the effective utilization of chemicalization and in increasing the payment of its own way in harvest. All the designs and activities of this service are fully subordinated to the interests of raising acreage yield and farm productivity, and it strives to make each of its actions advantageous and suitable for the kolkhoz and sovkhoz. While introducing the method developed by Rosselkhozkhimiya for complex agrochemical cultivation, the work of the chemicalization service is constantly becoming more of a factor in the final result. In the current year, for example, a new planning index has been established for the first time for regional associations: the growth of agricultural production from fields subjected to complex chemicalization. Thus, Selkhozkhimiya, from an organization fulfilling individual, disconnected types of agrochemical work, is turning into a subdivision that guarantees direct growth of agricultural production.

All subdivisions that exist in oblasts, krays, ASSR's, and rayons and do work relating to the chemicalization and plant protection in agriculture, have now been transferred to Selkhozkhimiya and now appear as a unified service. Still remaining is the completion of its formation in the chief production link--the kolkhoz and sovkhoz.

Of 24,000 kolkhozes and sovkhozes of the RSFSR, only 3,500 have chemicalization centers. A majority of them are of the intra-farm or state cooperative types. Remote affiliates of regional Selkhozkhimiya associations have also been created; they work for three to five farms. All these types of chemicalization centers are fully viable. They are bringing agrochemical service closer to the field and are intensifying feelings of mutual responsi-



responsibility between Selkhozkhimiya and kolkhozes and sovkhozes for the effectiveness of chemicalization. Their creation at each farm should be accelerated.

By the end of the 12th Five-Year Plan, it is planned to double the annual volume of work on complex agrochemical field cultivation (KAKhOP) and to add up to 23.5 million hectares to the overall acreage of high-fertility fields through complex chemicalization. In order to accelerate the rate of introducing KAKhOP, it is necessary, first of all, to search for additional resources for organic fertilizers by increasing peat extraction, maximal use of straw, and simultaneous organization of the preparation of peat-manure composts with the use of liquid and semi-liquid organic matter. Of no less significance is expanding the production and distribution of lime- and gypsum-containing materials by various agencies to every oblast, kray, and ASSR for chemical improvement of acid or salty soils.

As a rule, fields that have undergone complex chemicalization are set aside for agricultural crops cultivated by intensive and industrial technology. At the same time, grain crops receive significantly greater application of fertilizers, pesticides, and other chemicals that is usual for others. They are applied against the best agrotechnical background, that is, during bare fallow or the second year after it. The intensiveness of cultivation of grain crops also indicates that when the size and number of fertilizer and pesticide applications increase, the quality of their application sharply improves. Plant nourishment and protection are accomplished at each stage of their development strictly on a scientific basis. We are speaking here about work not on experimental sectors or small cultivation areas, but about the every-day practice of cultivating grain crops on large areas.

In the autumn of 1985, winter grains were sown on 9,030,000 hectares with intensive technology. In addition, the soil was prepared and fertilizer applied, beginning in autumn, for spring wheat, corn, millet, rice and buckwheat that will be cultivated on an area of 7,637,000 hectares in 1986.

In all, for crops being cultivated by intensive technology on a total area of 16,667,000 hectares, it is intended to introduce 2,970,000 metric tons of mineral fertilizers in effective substance or more by a factor of 4 than was introduced for these plantings up to the introduction of intensive technology. This will allow for an additional 14,300,000 metric tons of grain in 1986.

Intensive technology is being introduced on a broad scale in Siberia, which makes up 25 percent of its RSFSR volume. Here, spring wheat is cultivated with intensive technology. The largest sowing area is concentrated in Omsk Oblast and Altay Kray. Already, the first results show that, where all elements of intensive technology for spring wheat were fully observed, large harvests were obtained. At Mikhaylovskiy Sovkhoz in the Ust-Kalman region of Altay Kray, for example, from an area of 2,000 hectares, 28 centners of grain were obtained from each hectare. From 1800 hectares of intensive sowing at Kharitonovski Sovkhoz in Zavyalovskiy Rayon of this same kray, 24.7 centners of spring wheat were obtained from each hectare. Five to nine centners greater harvest of spring wheat than usual were obtained in Omsk Oblast, including the



kolkhoz imeni Sverdlov Sargatskiy, the Yuzhno-Podolskiy Sovkhoz, in Cherlaskiy Rayon, and the Tsentralno-Sovkhoz Lyubinskiy Sovkhoz in Lyubinskiy Rayon, and others.

What is the nature of agrochemical support of intensive technology for spring wheat? As is known, bare fallow is the most responsive to complex agrochemical field cultivation. But competently introduced KAKhOP is a reliable guarantee for achieving high levels of spring wheat harvest. The consequences of KAKhOP positively affect the harvest of spring wheat also when it is the second crop after bare fallow. All of this should be the basis for field selection for conducting complex agrochemical cultivation.

While broadly introducing soil conditioning, the fallow is precisely the place in crop rotation where it is possible to build in the means for chemicalization.

Complex agrochemical field cultivation in these zones necessarily includes the application of phosphorus and potassium fertilizers and means for plant protection, and the conducting of anti-erosion work. As for the application of organic fertilizers, there must be a differentiated approach. In Siberia are a number of regions where the soil has a high humus content. But the majority of regions suffer a shortage of organic fertilizers. In Novosibirsk Oblast, for example, the demand for them is satisfied 43 percent by manure and poultry droppings, in Omsk Oblast, 31 percent, Chelyabinsk Oblast, 64 percent, and Altay Kray, 39 percent. In providing organic substances to the soil, an important place must be allotted to the sowing of green fertilizers. The RSFSR Ministry of Agriculture, in its order on this subject, adopted a proposal by the oblasts, krays, and ASSR's of Siberia and the Far East on expanding the sowing of green manure crops. These volumes are still not large, but work should be expanded as decisively as possible.

Thus, the agrochemical base for the cultivation of agricultural crops by intensive technology (likewise by industrial technology) is complex agrochemical field cultivation. Its effectiveness (after-effects) in arid zones continues for 5 to 6 years. In the years following KAKhOP, only individual agrochemical maintenance measures are required.

For each field, an agrochemical certificate should be instituted and a plan developed, based on the results of soil survey, for the application of chemicalization and, where necessary, a plan-estimate documentation, data from which should be entered on the technological chart of crop cultivation.

The size of applications of fertilizers is established, as a rule, according to zonal standards. A specific amount for each field is determined by the balance method, the essence of which consists of making a calculation of possible consumption of nutritive elements from the soil (with consideration of the coefficients of their utilization) and in this connection determining the quantity of mineral fertilizers necessary to achieve the planned harvest.

Usually, for the accommodation of spring wheat, nitrogen fertilizers are not required during bare fallow, since a sufficient quantity of nitrogen is

accumulated in the process of nitrification in the resting soil. However, this does not always occur. Often, with poor maintenance of fallow or unfavorable weather that hinders nitrification, the need arises for application of nitrogen even in fallow.

In Eastern and Western Siberia, the method of the Siberian Scientific Research Institute of Agriculture is applied; this permits determination of the content nitrate nitrogen in the upper 40-centimeter layer of the soil in October-November or early spring before it thaws, and establishing to what extent plants in the field will be supplied with nitrogen. Gradation has been developed according to various types of soil. Thus, the need for nitrogen fertilizers should be established according to diagnostic results.

In accommodating a second crop of spring wheat after fallow, fertility potential created because of KAKhOP is taken into consideration and the necessary fertilizers are additionally applied. As a whole, the system of compensating for nutritive substances in the soil should take into account many factors, including, of course, the varietal response of wheat to a particular kind of chemical. The creative side of agronomy and agrochemistry consists of taking these factors into account.

Let us speak now about methods for working mineral fertilizers into the soil. When they are applied by rotary scatterer and worked with a cultivator, from 20 to 100 percent of the fertilizers penetrate the soil no deeper than 4 cm. Almost all of them remain in the surface layer and by harvest they are hardly working at all.

With KAKhOP, fertilizers are worked more deeply into the soil, and this increases their effectiveness. Phosphorus and potassium fertilizers can and should be applied during fall plowing to difficult soils being prepped for the second crop of spring wheat after fallow. This increases the effectiveness of mineral fertilizers and, consequently, their application at fall plowing should receive significantly greater attention. But if this is not done, it is imperative in the spring to work the fertilizers into the root-nourishing layers of the soil.

In a number of oblasts, and especially in Tyumen Oblast, the so-called "cutting in" method is used to get fertilizers into the soil. For this are written-off grain seeders with the aid of which mineral fertilizers are cut into the soil to a depth of up to 15 cm in the spring before the sowing of spring wheat.

The quality of chemicalization, but then also the pay-off in harvest, depends on how the mineral fertilizers are stored. Measures must be carried out that eliminate spoilage of fertilizers and prevent their being placed under open skies. Delivered fertilizers, especially unpackaged, become compacted during storage and need to be sifted. For this, old grain-cleaning machines can be used or metal screens can be set up on truck beds. It is necessary also to do everything possible so that the chemicalization means designated for intensive technology are used only as prescribed.

The cultivation of spring wheat with intensive technology is only beginning. It has a big future. But, right off, it requires the strictest technological discipline and obligatory maintenance of all the agrochemical operations from which the concept of intensive technology is growing. First of all, this is the application to the soil of chemicalization means of scientifically approved quality in strict correspondence to the methodology of complex agrochemical cultivation and the creation of a fertility level that guarantees the achievement of the planned harvest. Second is the additional application in periods of plant development of the required quantities of chemicals calculated by the balance method on the basis of diagnostic methods of inspection. Third is the implementation of a complex of measures for fighting diseases, pests, and weeds according to the results of phytosanitation inspection of sowings. Fourth is the dipping of seeds into effective solutions, their encrustation, and treatment with microelements. Fifth is the treatment of seeds and sowings with retardants to give plants resistance to lodging and disease. And, finally, tissue and leaf diagnostics for the organization and conduct of non-root feeding of sowings of strong and hard wheat.

Even if only one of these operations is left out or conducted without following the rules, these sowings will be regarded as common and ordinary and not in the category of those being cultivated by intensive technology. As established, it provides the intended level of harvest only when all its elements are strictly followed, without exception.

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## TILLING AND CROPPING TECHNOLOGY

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### IMPROVED CHEMICAL SUPPORT TO MAINTAIN SOIL FERTILITY

Moscow SELSKOYE KHOZYAYSTVO ROSSII in Russian No 12, Dec 85 pp 2-4

[Article by V. Belchenko, chairman of the All-Russian Rosselkhozkhimiya Association: "Chemical Support In Behalf of the Harvest"/

[Text/ Intensification and the technological and organizational rebuilding work being carried out today within the agroindustrial complex dictate their own requirements with regard to the use of chemical processes. Special importance is being attached here to achieving the greatest possible results from the available potential and to improving the quality of agrochemical work. And this need is quite proper. Indeed, the use of chemical processes in agricultural production, a leading factor for intensification, has become an indispensable part of scientifically sound farming systems and the foundation for the use of intensive and industrial technologies in the cultivation of agricultural crops. The role played by the use of chemical processes in livestock husbandry and feed production is increasing with each passing year.

During the years of the 11th Five-Year Plan, the unified specialized service for the use of chemical processes in agriculture in the RSFSR produced a considerable increase in the volumes of agrochemical work. For example, the average annual deliveries of mineral fertilizers increased by 24 percent and this made it possible to increase the fertilized area by 9 million hectares compared to 1981. The annual volumes for the liming of acid soils were raised to 4.2-4.6 million hectares -- or 1 million more hectares than the level for the 10th Five-Year Plan. During the 1981-1985 period, noticeable increases took place in the volumes of organic material shipped and applied, in the carrying out of chemical protection work and in peat and lime procurements. A substantial reduction was observed in the area of soils having low levels of accessible nutrient forms. The amount of arable land having a low content of mobile phosphorus and exchangeable potassium decreased by 10 and 4 percent respectively. And this amounted to many millions of hectares.

Rosselkhozkhimiya is a young organization. For it, the years of the 11th Five-Year Plan were years devoted to the establishment and development of basically new means and methods for solving the many problems associated with the use of chemical processes. From the very beginning, the work of Rosselkhozkhimiya and all of its efforts and thoughts were devoted to serving the interests of the kolkhozes and sovkhoses and raising the productivity of farming and livestock husbandry. Such a position taken by this new service was warmly

accepted on the farms and this created fine prerequisites for the development and implementation of improvements in the effectiveness of chemical processes in agriculture.

From the moment of its creation, Selkhozkhimiya was clearly confronted with the problem of developing a basically new approach for the carrying out of agrochemical work, one which would be unique for this unified service for the use of chemical processes. A method was needed which would make it possible to exert a direct influence on growth in the agricultural crop yields and which would ensure a return from the chemical resources employed. This gave rise to a new organizational-technological system -- KAKhOP /kompleksnoye agrokhimicheskoye okultivirvaniye poley na zadannuyu urozhaynost; all-round agrochemical cultivation of fields for an assigned yield/. Since 1981, the volumes for the introduction of KAKhOP into operations have increased by more than tenfold and in 1985 the system encompassed more than 3 million hectares. Overall, approximately 9 million hectares of chemically treated land were placed in operation during a five-year period. The experience accumulated in their use during these years serves to underscore the great potential of the new system.

These then are just a few examples. In Vladimir Oblast, at the Kolkhoz imeni Baturin, the yield in winter wheat grown using the intensive technology on a chemically treated field amounted to 42.3 quintals per hectare. The KIM Sovkhoz in Tambov Oblast obtained 52 quintals from each of 142 hectares and the kolkhozes imeni 1 May and N.K. Krupskaya in Tselinskiy Rayon in Rostov Oblast -- 57 and 60 quintals per hectare respectively. On these farms, where the winter wheat sowings were grown using the intensive technology on agrochemically cultivated fields, the increase in yield reached 12-26 quintals per hectare. The average increases in yields obtained from KAKhOP fields were as follows: for spring and winter wheat -- 46 percent, barley, winter rye and potatoes -- 29 and corn for silage -- 30 percent.

The agricultural chemists presently have at their disposal data on the effectiveness of KAKhOP both during the initial period following the carrying out of work and also for the subsequent period. This data reveals that the yields being obtained from these fields have increased an average of 30-40 percent. From a contractual organization with regard to kolkhozes and sovkhozes, Selkhozkhimiya has been converted into a service which directly ensures an earlier assigned increase in yield for crops grown on chemically treated fields during the course of a crop rotation plan.

The all-round agrochemical cultivation of fields is being introduced into operations most successfully and with fine rates in the Tatar, Mordovian, Chuvash and Bashkir autonomous republics and in Vladimir, Gorkiy, Lipetsk, Moscow and a number of other oblasts.

At the same time, all work carried out during the 11th Five-Year Plan directed towards developing the use of chemical processes should be viewed only as a beginning, as initial steps which are still unable to meet the agricultural requirements. Unfortunately, both in farming and livestock husbandry there is still not even one sector associated with the use of chemical processes in which all of the problems have been solved or the required level of work



achieved. For example, as yet only 54 percent of the amount of organic fertilizer required for maintaining a self-supporting balance of humus in the soil is being applied. The liming of acid land is being carried out on only 85 percent of the areas requiring such treatment and the figure is even less for gypsuming -- on 18 percent. The laying in of silage with use being made of preservatives is being carried out in a volume of 6-8 percent of the overall mass of ensiled feed. Notwithstanding the considerable increases that have taken place in the deliveries of mineral fertilizers, pesticides and chemical agents for livestock husbandry, the requirements for them, just as in the past, are still not being satisfied fully. Improvements are required in the effectiveness of the work being carried out: the chemical service is still not realizing a proper return from the fertilizers applied. At the present time, the normative return from the use of mineral fertilizers is being realized only when they are used in behalf of grain crops. In the case of other crops, the return from the use of fertilizers in the form of potato and sugar beet yields amounts to roughly 60 percent of the norm and for vegetables -- 36 percent.

It bears mentioning that the chemical service has still not been developed to the point where it is capable of satisfying completely all of the requirements of agriculture. Although Selkhozkhimiya associations have been organized in practically all regions of the Russian Federation, almost one half of them failed to create the material base required during the 11th Five-Year Plan and thus they are able to carry out only 45-50 percent of those work volumes expected to be carried out by the forces of Selkhozkhimiya.

The fact that many rayon associations do not have at their disposal the base required for the acceptance and storage of chemical resources is especially alarming. Of 1,740 Selkhozkhimiya associations, more than 380 of them are accepting the resources in areas of general use and this is resulting in great losses and in a reduction in the quality of the materials being supplied. An even worse situation exists in connection with ensuring that kolkhozes and sovkhoses have remote mechanized storehouses at their disposal for the storage of mineral fertilizers. As yet, the requirements for such storehouses are being satisfied by only 18 percent. Roughly the same situation prevails in the case of farmyard manure storehouses, platforms and departments for composting and landing and take-off strips.

The repair and operations base for Selkhozkhimiya associations is not sufficiently developed. The requirements for stations for the technical servicing and repair of tractors, motor vehicles and specialized equipment are being satisfied by only 40 percent and for motor vehicle garages and well organized parking areas -- by 60 percent. By no means has the work by the laboratory and diagnostic services been organized in all regions.

Nor can we accept as satisfactory the situation with regard to the development of the service for the use of chemical processes at the main production level -- at the kolkhozes and sovkhoses proper. Practical experience testifies to the fact that the return from applications of fertilizer and plant protective agents is greater in those areas where intra-farm stations for the use of chemical processes have been created and are in operation. Unfortunately, there are still only 3,000 such stations for 25,000 kolkhozes and sovkhoses in Russia.

The quality of agrochemical operations is being adversely affected by the absence on the farms of agronomist-agrochemists and agronomists for the protection of plants. Taking into account the level achieved in the use of chemical processes and the use in agriculture of many different fertilizers, pesticides, growth regulators and other resources, we can no longer rely upon the general knowledge of agronomists. Specialists in the use of chemical processes are required here.

Solutions have still not been found for those problems associated with a deficit of phosphorus in the soil and shortages in limestone and gypsum-containing materials for the chemical reclamation of land and organic fertilizers. The problem concerned with improving the quality and expanding the assortment of fertilizers is becoming more and more pronounced. With the intensive introduction of intensive technologies, a requirement has developed for special forms of nitrogen fertilizers for applying top dressings, for micro-fertilizers and for highly effective herbicides. The equipment placed at the disposal of the service for the use of chemical processes leaves a great deal to be desired. Many machines and mechanisms are not satisfying the requirements being imposed by modern production operations.

The all-round program for the use of chemical processes in RSFSR agriculture during the 1986-1990 period, developed by the Rosselkhozkhimiya Association, calls for solutions to be found for these and other problems. The program calls for a further increase in the volumes of agrochemical operations, growth in the return from the use of chemical resources in the form of yields, the development of a production base for the chemical service and improvements in the economic relationships between farms and Selkhozkhimiya. Within the program, a great amount of attention is given to improving the technology and the organization and economics of the agrochemical operations.

During the 12th Five-Year Plan, an important role will be played by the introduction of an organizational-technological system for the all-round agrochemical cultivation of fields, on which use will be made mainly of intensive and industrial technologies for the cultivation of agricultural crops. In addition, there will be programming of yields and the effective use of reclaimed lands.

During the new five-year plan, the plans call for KAKhOP to be employed on 20 million hectares. This will make it possible to increase the overall fund of highly fertile and chemically treated fields to 28.5 million hectares by 1990.

At the same time, every attempt should be made to ensure that the KAKhOP system includes the mandatory use of local methods for applying fertilizers, low-volume methods for the use of pesticides, belt placement of herbicides and other progressive technological methods. In particular, the plans call for row fertilization of spring grain crops to be carried out on up to 39.7 million hectares by 1990, or almost 4 million more than the level for 1985. A considerable increase will take place in the scale of use of foliar top dressings for grain crops grown using intensive technologies. Low-volume spraying of crops will be employed on an area of 40 million hectares (130 percent of the 1985 level) and ultra-low-volume spraying -- on 200,000 (more by a

factor of 2.5) and belt placement of herbicides -- on an area of 700,000 hectares (more by a factor of 4.6).

Now concerning organic fertilizers. The plans call for the average annual increase in organic fertilizer applications to kolkhoz and sovkhoz fields to be raised to 15 million tons. Thus, 575 million tons of organic fertilizer will be applied in 1990. However, such volumes cannot be achieved merely through use of the farmyard manure and litter obtained from the planned numbers of livestock and poultry. Therefore the plans call for the extraction of peat to satisfy the needs of agriculture to be increased to 124.4 million tons by 1990 (in 1985, the procurement of peat for fertilization and bedding purposes is planned in the amount of 105 million tons). The realization of these plans will depend to a large degree upon the aquicultural organizations fulfilling their plans for the drainage of peat bogs. Indeed, in order to ensure the planned procurement volumes, the peat procurement enterprises must have more than 125,000 hectares of drained peat bogs by 1990. This bears mentioning owing to the fact that during the 11th Five-Year Plan the absence of a front of work restrained to a considerable degree the procurement of peat for agriculture.

The construction of shops and platforms for composting, the overall capability of which must be raised to 63 million tons annually by 1990, will aid in bringing about an increase in the production of high quality composts. The situation with regard to the construction of manure-pits at kolkhozes and sovkhozes must also be corrected in a decisive manner. We must not allow a breakdown to occur in the plans for constructing them as did in fact occur during the 11th Five-Year Plan.

The technology employed for applying organic fertilizers also requires attention. The time is at hand for completely eliminating the practice of applying organic materials using bulldozers, toothless drag harrows and other like items of equipment. Today agriculture requires primarily highly productive organic fertilizer spreaders and specialized equipment for transporting and applying (including intra-soil) liquid fractions of organic materials. Nor should the collectives of branch scientific-research, design and industrial organizations and enterprises stand off to the side in an attempt to avoid this problem.

And a most important consideration is that of ensuring that organic materials acquire the status of a farm product and thus are recognized as having value. The production volumes for these materials should be planned and the necessary resources should be allocated in their behalf.

The agricultural requirements for organic fertilizers dictate a need for making more extensive use of straw, lignin and other waste products of organic origin for this purpose. The use of sapropel for fertilization purposes should be improved. The task is one of ensuring that use is made of not less than 650,000 tons prior to the end of the new five-year plan and by the end of 1990 -- not less than 1 million tons of this valuable resource. This will make it possible to increase the content of organic substance in the soil.

Selkhozkhimiya must display concern for procuring and applying sapropel to the soil. With regard to the planning and construction of hydraulic engineering

installations and also the procurement of sapropel, some effort must be undertaken by those aquicultural enterprises which have all of the resources at their disposal for carrying out this work.

The all-round program for the use of chemical processes calls for an expansion in the sowing areas for green manure crops, which are referred to as green fertilizer for the fields. The plans call for the area sown in these crops to be increased by more than threefold and to reach 865,000 hectares by 1990. In carrying out this work, more extensive use should be made of the experience of farmers in the Tatar ASSR, who are already paying serious attention to the use of green manure crops.

In the all-round program for the use of chemical processes, considerable importance is being attached to the liming of acid soils. The importance of this work is borne out by the fact that in order to achieve an optimum acidity level for the republic's arable lands, liming work must be carried out on 9-9.5 million hectares annually and not less than 100 million tons of lime fertilizer applied. At the present time, the annual level for liming operations amounts to 4.6 million hectares of agricultural land, with 35 million tons of lime being applied.

The chief restraining factor with regard to growth in the volumes of liming work is an ameliorant shortage. Meanwhile a majority of the regions have raw material supplies at their disposal which make it possible to satisfy completely the agricultural requirements for lime fertilizer. But another fact is also well known. The production of lime powder in Vologda, Kalinin, Orel and Kirov oblasts amounts to only 20-30 percent of the requirement and in Ryazan, Gorkiy, Perm and Sverdlovsk oblasts -- 40-60 percent. It is obvious that the local organs in these and a number of other oblasts are not attaching sufficient importance to chemical soil improvement work or to the fatal effect which an increase in soil acidity has on the status of affairs in the farming branch. Quite often the construction of lime quarries and plants is dragged out over a period of a number of years and the enterprises are only poorly supplied with man-power, transport and approach roads.

The solutions for these problems cannot be postponed any longer. Today we speak about the need for creating at all enterprises engaged in the processing of carbonate-containing raw materials (and this includes not only plants for industrial construction materials, but also the quarries of construction and highway departments, construction industry plants and cement and brick plants) of units for the milling of limestone having a capability for producing 50,000-100,000 tons annually and for delivering the ameliorants to nearby regions by means of motor transport.

In addition, the enterprises in many oblasts have considerable quantities of lime waste products -- chalk, ash, defecation mud, slag and slime. The work is profitable only if the local organs task each enterprise with improving the waste products to the point where they satisfy the agricultural requirements and also the requirements for the deliveries of these materials to the kolkhozes and sovkhozes.

Special sections of the all-round program for the use of chemical processes are devoted to phosphorite fertilization and to the reclamation of saline lands.



For example, according to the data obtained from a recent inventory carried out by Roszemproyekt, the agricultural lands of the RSFSR include 27.7 million hectares of solonetz soils and their complexes. Roughly one half of this amount is arable land.

Chemical reclamation -- applications of gypsum -- is considered to be an important element in the all-round reclamation of solonetz soils. Gypsum applications must be carried out annually on 400,000 hectares, with not less than 4 million tons of gypsum-containing materials being applied to this area. However, up until now the annual volumes for gypsuming operations have not exceeded 60,000-70,000 hectares and this, just as in the case of liming operations, is explained by a shortage of the ameliorant. And yet vast supplies of phosphogypsum have accumulated in the scrap heaps of plants engaged in the production of mineral fertilizers.

The task consists of converting these waste scraps into a valuable ameliorant. This will make it possible to solve still another problem: to terminate growth in the scrap heap mountains of phosphogypsum, which contaminate the environment.

During the 12th Five-Year Plan, a substantial improvement must be achieved in the use of mineral fertilizers, the deliveries of which will increase. More than 50 percent of the overall volume of fertilizer deliveries will be used for grain crops. The plans call for the extensive use of such effective forms of fertilizer as liquid complex fertilizers and liquid ammonia. The delivery volumes for ZhKU /liquid complex fertilizer/ will increase from 890,000 tons in 1985 to 1,530,000 tons in 1990. The plans call for the use of liquid ammonia to be increased to 1,430,000 tons in 1990 (445,000 tons in 1985).

Today all work carried out with mineral fertilizers must be directed towards increasing the return in the form of agricultural crop yields.

During this modern stage in the development of agricultural production, the protection of plants against pests, diseases and weeds is becoming an important factor with regard to raising the crop yields. Each year, as a result of carrying out protective measures, the farms of Russia protect not less than 25 million tons of agricultural products valued at 2 billion rubles. Each ruble expended for the protection of plants is returned the same year in the form of 2-3 rubles worth of products.

Over the next few years, for the purpose of protecting plants against pests, diseases and weeds, the plans call for the chemical disinfection of potato tubers on an extensive scale and for treating seed with film-forming materials.

During the past five-year plan, a new branch for the use of chemical processes in agriculture clearly made its presence known -- the use of chemical processes in livestock husbandry. The problems concerned with ensuring that the livestock and poultry are supplied with common salt and chalk have been solved completely, the deliveries of feed phosphates have been increased by a factor of 2.1 and those of feed preservatives -- by a factor of 2.5 and the volumes for the use of liquid ammonia for treating coarse feeds have increased fourfold. At the present time, concern must be displayed for eliminating the deficit of



phosphorus and microelements in the animal rations and also for expanding sharply the use of chemical preserving preparations. These are important tasks. It is sufficient to state that the chemical preservation of silage makes it possible to reduce nutrient losses by a factor of 2-3 compared to conventional ensiling. According to scientific data, a kilogram of chemical preservatives protects the same quantity of nutrients found in 10 kilograms of milk or one and a half kilograms of meat. Plans call for the use of not less than 230,000 tons of chemical preservatives by 1990 and this surpasses by a factor of six the level of their use during 1985.

Further improvements in the use of chemical processes in livestock husbandry will depend to a great deal upon scientific support for this new branch. However, there is not one NII /scientific research institute/ in the Russian Federation that has undertaken to coordinate studies in the use of chemical processes in livestock husbandry. This is making it difficult to solve completely the problems concerned with the use of chemical feed preservatives and it is restraining the development and production of new mineral additives.

An important and fundamental discussion of a broad range of problems associated with the development of the agro-industrial complex took place in Tselinograd during a meeting of the party-economic aktiv of Kazakhstan and the krais and oblasts of Siberia and the Urals. Here it was stated that the time in which we live and the tasks which confront us demand that we carry out the planned program in a firm, decisive and wise manner. And this requires that each collective undertakes all of the measures required for ensuring the successful carrying out of the plans and the creation of a fine stockpile for performing effective work during the 12th Five-Year Plan. These tasks are now confronting the service for the use of chemical processes in Russia.

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## FORESTRY AND TIMBER

### S&T APPLICATION IN FORESTRY, TIMBER INDUSTRY URGED

Moscow EKONOMICHESKAYA GAZETA in Russian No 2, Jan 86 p 6

[Article by V. Baushev, economist at the Giprolestrans Institute, Leningrad: "Felling: Ways to Industrialize"]

[Text] In the main procurement areas our lumber industry is presently separated from timber management. The single natural and industrial process of procuring lumber and restoring the timber is split up into departments. Procurement is handled by economically independent enterprises of many ministries and departments, while timber restoration is performed by the timber management agencies alone. In other words, the lumber industry and timber management are isolated from each other.

The timber resources which we can count on for the future, however, depend to an enormous degree upon how properly they are utilized today. Felling is the basis of two processes: the process of obtaining the necessary assortment and that of regenerating the timber. The felling procedure affects the kind and extent of the work required to regenerate the timber, and the possibility of additional cuttings.

The draft Main Directions for National Economic and Social Development sets the important task of intensifying efforts to see that the timber is used efficiently. It is my view that the conclusions reached about the forests long ago by the scientists should be used to accomplish this.

It has been demonstrated, for example, that with selective or gradual fellings in forests of diverse ages, which predominate in the European part of the nation, 1.5 to 2 times as much lumber can be obtained per hectare over a period of 80-100 years as is now being obtained. These effective methods are still being employed extremely rarely, however: on only 7.4 percent of the total area. The lumber enterprises by long tradition still make solid cuttings on the rest of the territory, which exceeds 90 percent of the total.

Also by tradition we perform the following operations: felling, skidding, chopping off the branches, then hauling the trunks to a lower timber yard and separating them into grades. This is the fixed technology. So much wood remains in the felling areas that it cannot be called waste-free or even low-waste. In the Scandinavian countries, however, trees have not been skidded for a long time, because this damages the rest of the stand. There

are no lower timber yards at all: The grading is done by means of mobile equipment right in the felling area.

It is very easy to call the existing lumber procurement technology backward, of course. We cannot disregard the historical and economic reasons for this, however. What are they?

Remember that the large-scale mechanization of timber procurement at the end of the 40's coincided with the period of restoration of a national economy destroyed by the war. The availability of large timber tracts in areas accessible for exploitation and the great need for lumber forced us and permitted us to conduct the "harvesting" of mature timber stands by the solid felling method. Restoration of the forests had to be given second priority.

Machine building for the timber industry was also oriented toward the manufacture of equipment for solid felling.

And this timber procurement system has been retained down to the present. Furthermore, technical progress has been oriented toward improving precisely the solid felling system. Today, for example, we have powerful skidding tractors and equipment with various suspended components which even trim off the branches. Intelligent "hands," or manipulators, are installed on the tractors.

One will not find a small maneuverable tractor capable of transporting several selected trunks of overmature timber in the felling areas, however. Horses previously handled this operation. Unfortunately, however, in forests of the Northwest, for example, they have now earned their place in the "Book of Honor."

It is becoming perfectly obvious that adjustments have to be made in the technical policy of the USSR Ministry of Timber, Pulp and Paper, and Wood Processing Industry and the USSR State Committee for Forestry, and the machine builders refocused on the production of equipment making it possible to carry out the most effective selective and gradual fellings.

The economic aspect of the matter is also important. What is the reasoning of the contemporary director of a timber procurement establishment? Cubic meters are demanded from me, and I have to produce them--even though he knows that new woods will only mature in 80-100 years on areas of solid felling. Today, economic incentives are provided for the cubic meter of procured lumber. The plan figures do not take into account how the cubic meter was procured or on what area.

Incidentally, under the existing system solid fellings are more profitable than gradual or selective cuttings also for the forestry establishment. They produce bare areas which make it possible to utilize existing equipment for planting and thus to fulfill the forest planting plans.

By employing solid fellings and gradually eliminating the best remaining tracts in the most accessible areas, the timber industry is steadily reducing its area of operation.

Over the past 15 years certain large timber procurement associations in the European part of the USSR have sharply reduced the amount of lumber hauled out: Karellesprom by 29.3 percent, Permlesprom by 28.1 percent and Sverdlovsklesprom by 21.7 percent, for example.

The distance between the timber procurement areas and the consumption sites is gradually increasing, and there are additional transport costs and timber supply difficulties caused by the overloading of the rail transport system.

Of all the bulk freight hauled by rail, lumber is presently transported the greatest distances. The average distance of lumber shipments was 751 kilometers in 1940, 1,502 in 1965, 1,645 in 1975 and 1,731 in 1982. It now approaches 2,000 kilometers.

A trend has taken shape in recent years whereby the timber industry has lagged behind the national economy's needs for lumber. The basic direction for eliminating this was defined in the decree passed by the CPSU Central Committee and the USSR Council of Ministers "On Improving the Use of Timber Resources" by establishing permanent, comprehensive forestry enterprises for the reproduction of forests, the procurement and the total processing of lumber.

At such enterprises, the document stated, the procurement of lumber and reproduction of the woods would constitute two sides of a single production process and should therefore be placed onto an equal footing. This has apparently created difficulties with the development of a statute on the comprehensive forestry enterprise, which was to have been approved back at the end of 1984. An indicator must be worked out for such enterprises, which would take into account the contribution of the timber procurers and the forestry management workers to the end result. That is, in addition to the indices which take current interests into account, there should also be one which could define the distant future.

We should not forget the fact that the regeneration of forests requires first of all area (land) and time. Consequently, we must have a calculation indicator which would take these factors into account. In our opinion, that indicator could be the volume of lumber removed from a unit of area per unit of time. This value would provide a reliable indication of how many cubic meters of lumber could be removed annually from a hectare of forest with continuous exploitation.

For example, 200 cubic meters is obtained from a hectare with solid felling, but in the case of coniferous species it cannot be repeated for 100 years. The figures are 90 cubic meters and 30 years for selective fellings. It is therefore expedient to use the year as the time period for calculations. All felling systems would be placed on an equal basis in this case.

The specific value for the plan indicator could be determined after mandatory, on-site surveys have been performed at the felling areas. These surveys should be started in areas with limited timber resources and in areas of operation of large timber processing enterprises.

In our opinion, the proposed indicator should be given priority when working out the main directions for scientific and technical progress for the permanent timber enterprises.



4 March 1986

## FORESTRY AND TIMBER

## EAST SIBERIA TIMBER PROCESSING PROBLEMS EXAMINED

## All-Union Seminar

Moscow LESNAYA PROMYSHLENNOST in Russian 2 Nov 85 p 2

[Article by A. Yevgenyev, Irkutsk Oblast: "Farewell to the Boat Hook?--Notes on the All-Union Seminar of Sawmill Workers"]

[Text] A portrait of a sector, like a portrait of a man, can be sketched using just a few strokes. But the graphic medium will be different--facts and figures--which are more spare and austere.

If one uses their language, the following data can tell us a great deal about the state of affairs in the lumber industry: at the majority of enterprises the level of mechanization of the basic technological operations at the raw materials depot does not exceed 20-25 percent, in the sawmill shop it does not exceed 40-45 percent, in raw timber sorting it is no more than 5-8 percent, and in the final processing section and in shipping it is no higher than 20-25 percent. Because of our inadequate technology and outdated equipment, labor productivity in countries with developed timber processing is 1.3-1.5 times higher than in our country. How can we raise the technical level of timber processing operations? This question was discussed at an All-Union seminar held recently in Angarsk.

Those attending the seminar said that the worst bottleneck at most modern sawmill and wood processing combines is in the unloading and preparation of raw materials for milling. The archaic and dangerous winch used to move the logs, the old boat hook in the hands of the workers who are moving the raw material through the pool--all this is a far cry from the concept of "technical progress." But what is there to offer in place of the system that has been used for decades? Practical experience shows that there is just one solution--to create fully mechanized units for preparing the raw material for milling that are based on sorting conveyors. The experience of the "Karellesoeksport" [Karelia Timber Export] Association is very useful in this respect. For example, the Kondopoga Wood Processing Plant rejected the traditional pool method and is sorting the raw material on dry land using the Finnish "Sateko" line system. Incidentally, the line is not the only important element here. A. Butskikh, deputy chief of the Petrozavodsk Special Design and Technological Bureau, said at the seminar: "We were convinced that the installation of sorting equipment would not solve the log sorting problem

completely, that we would have to re-equip the entire raw materials depot. We need hoisting cranes or automatic loading equipment for feeding the logs into the sorting system and for unloading the collectors, equipment and machinery for individual sorting of bunches of logs, for the formation and sorting of buffer stocks, and so on. All the transport operations were moved to dry land. Of course, this entailed considerable expenses. But, as they say, the game is worth the candle. As a result of the reconstruction, the productivity at the depot doubled, manual labor was completely eliminated, and there was a dramatic rise in the safety of operations at the depot."

The Medvezhyegorsk Timber Plant was re-equipped according to this same principle. But here the domestic BS-60 model was used instead of the imported "Sateko" line. However, Butskikh and other seminar participants acknowledged that this model is inferior to its foreign analogue in terms of productivity, it requires a greater amount of metal, and it is more complicated. The main thing, though, is that only three have been produced since 1981. It is true, as G. Milkov, chief designer at the Vologda State Wood Processing Design Bureau, reported, a fundamentally new design for the line was developed recently in collaboration with Finnish specialists. Work on the production of an advance model has been started. We hope that this time the machine tool designers will demonstrate model efficiency, test the innovation in a short period of time, and put it into series production. Timber industry workers are in great need of this type of equipment; it is no coincidence that "Karellesoeksport" couldn't wait for help from another sector and went ahead with its own resources and planned, assembled, and began testing a log-sorting line. Isn't this very fact a reproach to "Soyuzdrevstankoprom" [All-Union Timber Machine Tool Industrial Association]?

Estimates show that the equipment that has been produced in cooperation with Finnish firms is costly and will be profitable at plants with a capacity of no less than eight log frames. Smaller enterprises must either continue to use pools, or obtain new, less expensive sorting equipment. As you see, the problem of improved sorting equipment is still on the agenda.

Now let us turn to the butting and sorting of timber raw materials. This is another Achilles' heel of the timber processing plants. The seminar participants visited the "Kitoyles" [Kitoy Timber] Association, where a two-stage system for sorting boards has been introduced. What does this system consist of? The new shop at the local timber transfer base has three flow lines. One assembly is for small timber, the other two are for large-diameter raw materials. A feeder was installed right after the trimming machines, which "feels" the boards moving along the conveyor. On the basis of its signal the timber is sent to three cutting machines (and to a total of six in the entire shop). Then the boards are sent to the LTS-16M sorting and butting line, where the butts are trimmed and sent to 16 pocket collectors depending on their length and quality (there are two such lines in the shop). Operators control the technological process.

As a result, the work of 50 people has been made easier, and the sorting section itself needs 12 fewer workers than in the neighboring shop where the boards are sorted manually. The LTS-16 set of equipment has proven itself with great success at the Svktyvkar Timber and Woodworking Combine. More than 50

lines of this type have been manufactured already. About 20 of them have been installed. This should not come as any surprise since the majority of them are not equipped with a command unit, which means that the equipment cannot be used efficiently. This flaw must be eliminated as quickly as possible. The seminar participants recommended that "Soyuznauchdrevprom" [All-Union Wood Processing Industry Scientific Association] summarize the experience gained by enterprises and prepare its own suggestions for improving the design of the LTS-16 line.

An interesting and very promising innovation has appeared in the instrument building industry. N. Razumov, department chief at the Siberian Technological Institute, described experiments that involve covering saws with a polymer material. This type of instrument has a lower friction coefficient. Consequently, it is possible to reduce the initial widening of the teeth and as a result, increase the yield of lumber and industrial chips. In addition, these saws do not heat up to such high temperatures, which means that they are more durable and provide a higher quality product. They also require 15-18 percent less power. It is especially important that the instrument does not get gummed up with pitch when working with larch. Taking into account all these advantages, scientists estimate that this equipment saves more than 1 ruble per cubic meter of lumber. The seminar participants directed a request to the administrators of the USSR Ministry of the Timber, Pulp and Paper, and Wood Processing Industry to step up efforts to create a shop for coating round saws with polymers at the Ivano-Frankovsk Timber Combine.

Issues of a regional nature were also touched on at the seminar; their regional focus does not mean that they are any less important. Ye. Kudryashov, chief engineer at the "Irkutsklesprom" [Irkutsk Timber Industry] Association, said that several years ago machine tool builders replaced the wide-aperture RD-110 frames with the 2R-100 frames. This was not a very successful change. In Siberia and the Far East, where there are more large-diameter trees than anywhere else, quite a lot of high-quality timber was wasted. Apparently, it would make sense to reinstate production of the RD-110 frame, which has served the industry faithfully and reliably for a long time. Other specialists attending the seminar concurred with Kudryashov's suggestion.

V. Ponomarev, chief of the technical department at the "Daldrev" [Far Eastern Timber] Association, spoke about the isolation of sectorial science. He said that this is not the first year that there has been some discussion of creating a laboratory in the Far East for studying sawmill operations and preparing timber raw materials. Nothing has been done in this direction, however. It is time to take a serious look at the question of organizing branches of scientific research and planning institutes in the Eastern-Siberian region.

Relatively recently a gigantic sawmill plant was put into operation at the Ust-Ilimsk Timber Industry Combine. In terms of its level of equipment, it is unequalled anywhere in the country, but it is still working below its potential. I. Kovalchuk, chief of the association's planning and production control department, believes that this is due partly to planning errors by Giprodrev [State Timber Industry Design Institute], and design flaws by the Vologda GKBD. For example, various links of the technological process are too closely connected, starting with the delivery of raw material into the mechanized pool and ending with the removal of the finished product from the

roller conveyors. The depot is not large enough for creating the planned reserve of raw materials. No provision was made for heating the outside pneumatic transport system, which carries sawdust and chips, and in the winter the line freezes. No attention was given to the problem of gathering bark and removing broken logs from the pool, or to mechanized packing of bundles in waterproof paper. There is a need for constructive completion and an increase in the reliability and quality of the plant manufacturing, rolling tables, lines for turning logs, cutting and trimming machines, and OK-80 and OK-40 bark-strippers.

All these shortcomings should be taken into account in the planning and construction of new shops, and in particular, the second milling plant at the Timber Industry Enterprise. The powerful sawmill industry in Ust-Ilimsk, created on the basis of domestic and imported equipment, can and should become in many respects a model and a standard to follow.

#### Irkutsk Oblast Party Conference

Moscow LESNAYA PROMYSHLENNOST in Russian 28 Dec 85 p 3

[Article by V. Kalinkin and S. Salomatin, special LESNAYA PROMYSHLENNOST correspondents, Irkutsk: "Why is the Yield So Low?--Notes on the Irkutsk Oblast Party Conference"]

[Text] The timber industry in the Angara River region accounts for one-tenth of the commercial timber, one-third of the railroad ties, one-fourth of the soft resin, and all of the cord pulp produced in the country. How can the operation of the sector be made more efficient? What needs to be done to step up scientific and technical progress in the most important sectors of the timber production complex? Considerable attention was given to these questions at the oblast party conference.

Workers, engineers, and managers at the largest associations and enterprises not only in the oblast, but in the country, such as the "Irkustsklesprom" [Irkutsk Timber Industry] All-Union Industrial Association, the Bratsk and Ust-Ilimsk timber industry complexes, secretaries of rayon and city party committees, and members of the oblast party committee with whom we met and talked on the eve of the conference and during the proceedings of the conference, noted that since the beginning of the five-year plan and especially in the past two years the sector has taken some important steps forward. It has become a leading sector and the total industrial output of the sector has now reached 1.6 billion rubles per year. However, both the speech given by V. I. Sitnikov, first secretary of the oblast party committee, and the statements by conference participants were devoted in their entirety to unresolved problems.

V. I. Sitnikov said: "The bureau, secretariat, and departments of the oblast party committee are devoting constant attention to increasing the efficiency of the sector's operations. In the past five years a total of 1.5 billion rubles has been invested in the development of the sector, and the rate of growth in production has reached 36 percent. But there have been no fundamental changes in the timber complex."

The speaker noted that during the course of the entire five-year plan the timber industry has not fulfilled the production plan or the sales plan. Some of the giants, such as the Bratsk and Ust-Ilimsk timber industrial complexes and the "Irkutsklesprom" All-Union Industrial Association, allowed especially serious shortfalls. They fell short of production output goals by 389 million rubles.

Some of the main reasons for such serious shortfalls include incomplete utilization of timber raw materials, failure to complete construction of many main and auxiliary projects at the Bratsk and Ust-Ilimsk complexes, and the shortage of saw mill and tie shops at the "Irkutsklesprom" enterprises.

There are leading associations in the oblast where the introduction of waste-free technology has already resulted in a considerable effect. At the "Kitoyles" [Kitoy Timber] Association, for example, full utilization of timber raw materials exceeds 90 percent. The utilization of so-called wastes in production has made it possible to achieve an additional 7 million rubles' worth of production output here.

At the same time, the conference stressed that at the majority of timber enterprises in the oblast resource-saving technology is being introduced extremely slowly. As in the past, up to 3.5 million cubic meters of timber-cutting waste is left at logging sites in the Angara River area. Poor use is also made of milling by-products. They could be used to produce more than 3 million cubic meters of industrial wood chips, but one-third this volume is produced. Loggers and wood processing workers discard and burn sawdust, while plants in the microbiological industry sometimes stand idle for want of raw materials.

Large enterprises engaged in the procurement, processing, and reproduction of timber resources are being called on to solve the problem of thrifty and highly efficient utilization of the riches of the Siberian taiga. One of these enterprises is the Ust-Ilimsk Timber Industry Complex. This complex has put into operation capacities for the production of 550,000 tons of pulp, 600,000 cubic meters of lumber, and many products of the timber chemical industry. This timber industry complex could already serve as an example for other enterprises in the oblast and throughout the country, but the problem is that the funds spent on the construction of the complex are not yielding the proper return.

A. D. Goloshchapov, brigade leader in the "Ilimsklesstroy" [Ilimsk Timber Construction] Trust, spoke regretfully about this in his speech at the conference.

He said: "We must admit that our association is still suffering huge losses because the construction program has not yet been completed. The second lumber plant remains unfinished, along with a hydrolysis-yeast plant, a shop for producing boards made of pressed wood shavings, repair and maintenance enterprises, and social and cultural-use projects. During the course of the five-year plan the association has failed to complete construction on projects valued at 50 million rubles. Well aware of these shortcomings, the city and



oblast party committees still didn't manage to exert the proper influence on the operations of the main contractor--the "Bratskgesstroy" [Bratsk Hydroelectric Power Station Construction] Administration under the USSR Ministry of Power and Electrification, which has consistently failed to meet plans for construction and installation work.

"The enterprise moved to create its own construction industry base in order to carry out independent construction of absolutely essential projects and current repairs and reconstruction of enterprises. Prefabricated reinforced concrete is all that is needed during the first stage. But even here the ministry involved and the contracting organization under the ministry are not meeting the association halfway, even though tens of millions of rubles were spent on the development of the "Bratskgesstroy" reinforced concrete combine by the USSR Ministry of Timber, Pulp and Paper, and Wood Processing Industry."

In the speaker's opinion, the oblast party committee can and should put an end to the lack of coordination among various departments that is interfering with the creation of a major enterprise that is supposed to become the flagship of the industry.

V. A. Monakhov, secretary of the party committee at the "bratsk Timber Industry Complex" Production Association, also devoted his speech to problems that involve increasing the operating efficiency of enterprises in the complex.

He said: "The time has come for decisive action. The USSR Ministry of Timber, Pulp and Paper, and Wood Processing Industry must organize the structure of the association in such a way that the complex will have a reliable supply of raw materials, since the one-time measures taken by the ministry have had no significant results."

This approach to the issue is no accident. Fairly recently several timber management enterprises under the former "Bratskles" [Bratsk Timber] Association joined the Timber Industry Complex, but large capacities for the production of plywood and lumber continue to stand idle for want of raw materials, since, as in the past, a large volume of timber is sent outside the raw materials depot that is attached to the Bratsk Timber Industry Complex. Here, as in Ust-Ilimsk, there is still an intensive construction program that must be carried out for new projects and for the renovation of existing facilities.

The conference participants also stressed that despite numerous appeals by the oblast party committee, the sector's management staff has still not brought the production plan for roundwood into line with the availability of this material in the allotted timber resources. For example, A. G. Chernov, first secretary of the Tayshet City Party Committee, spoke about this in his speech.

He said: "For the first quarter of 1986 the 'Tayshetles' [Tayshet Timber] Association has planned to produce 88 percent roundwood, while the timber resources will provide only 70.4 percent."

As other speakers also noted, the issue involves outdated planning methods that undermine the economy of the enterprises and harm numerous consumers who do not receive all the products they need. Finally, one must reject stereotypes, and

it is time to take a new, more efficient approach to management--these thoughts were expressed with special force at the conference.

Participating in the conference were L. A. Gorshkov, deputy chairman of the RSFSR Council of Ministers; L. D. Kazakov, secretary of the All-Union Central Council of Trade Unions and member of the CPSU Central Committee; A. V. Maslov, instructor under the CPSU Central Committee; and the heads of a number of ministries and departments.

At the organizational plenum of the oblast party committee V. I. Sitnikov was once again elected first secretary of the oblast party committee.

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## FORESTRY AND TIMBER

### RSFSR TIMBER INDUSTRY COMPLEX ORGANIZATION DETAILED

Moscow LESNAYA PROMYSHLENNOST in Russian 30 Nov 85 p 3

[Unattributed article: "Large Complexes Are Being Set Up"]

[Text] In 1985 and 1986, 67 continuously operating integrated timber enterprises dealing with the cultivation, felling, and total processing of timber for the USSR Ministry of Timber, Paper and Pulp, and Wood Processing Industry will be organized on the territory of the RSFSR. Ten similar enterprises are also being organized on the territory of the RSFSR for the USSR State Committee for Forest Administration.

Large state forests are being carefully consolidated in regions where integrated timber enterprises of the USSR Ministry of the Timber and Wood Pulp Industry are operating.

In order to set up the abovementioned enterprises, a number of timber enterprises have been transferred from under the direction of the RSFSR Ministry of Forestry to the direct control of the USSR Ministry of Timber and Wood Pulp Industry. The lumber processing association, "Chelyabets," has been transferred from under the direction of the USSR Timber and Wood Pulp Industry to the RSFSR Ministry of Forestry.

It has been established that the currently existing procedures for utilizing timber resources and the production of wood products, including those earmarked for satisfying local demands, be maintained in the organization of the integrated timber enterprises operating on a continuous basis. The procedures for distributing and utilizing wood salvaged from pruning and public sanitation clearing will also be maintained.

As a result, the USSR Ministry of Timber and Wood Pulp Industry and the RSFSR Ministry of Forestry have issued a joint order. The associations: Karellesprom, Lenles, Novgorodles, Permlesprom, Sverdlesprom, and Tomlesprom; the Ust-Ilimskiy Lumber Industry Complex, the Central Scientific Research Institute of Mechanization and Power Engineering in the Lumber Industry, and the Karelian Scientific Research Institute of the Lumber Industry; the Ministry of Forestry of the Karelian ASSR, and the Leningrad Forestry Production Association; and the Novgorod, Perm, Sverdlovsk, Tomsk, and Irkutsk

directorates of forest administration have offered to takeover or transfer a number of timber enterprises. Specifically, the USSR Ministry of Timber and Wood Pulp Industry will assume direct control over:

In the Leningrad Oblast: The Boksitogorskiy Test Forestry Industrial Farm; the Volkhovskiy, Kirishskiy, and Tikhvinskiy forest administrations; the Lodeynopolskiy Test Forestry Farm; and the Svirskiy Forestry Industrial Farm;

In the Novgorod Oblast: The Khvoyninskiy, Dregelskiy, Borovichskiy, Moshenskoy and Lubyatinskiy forest administrations; and the Pestovskiy Forestry Industrial Farm;

In the Karelian ASSR: The Valdayskiy, Volomskiy, Kalevalskiy, Kestengskiy, Kostomukshskiy, Lenderskiy, Porosozerskiy, Prionezhskiy, Pyaozerskiy, Rebol'skiy, Segozerskiy, Sumskiy, Chupchinskiy, Yushkozerskiy, and Kemskiy forest administrations; and the Karel'smelioratsiyastroy Trust;

In the Perm Oblast: The Kudymkarskiy, Yurlinskiy, Kosinskiy, Yusvinskiy, Dobryanskiy, Taborskiy, Vizhayskiy, Sivinskiy, Chusovskoy, Komarikhinskiy, and Yayvinskiy forest administrations;

In the Sverdlovsk Oblast: The Alapayevskiy, Sinachikhinskiy, Serovskiy, Verkhotur'skiy, Novolyalinskiy, and Ousskiy forest administrations;

In the Tomsk Oblast: The Suyginskiy Forest Area of the Molchanovskiy Forest Administration;

In the Irkutsk Oblast: The Kaymonovskiy, Severniy, Rudnogorskiy, Ilimskiy, and Educhanskiy forest administrations.

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## FORESTRY AND TIMBER

### TIMBER MINISTRY COLLEGIUM REVIEWS 9-MONTH PRODUCTION TOTALS

Moscow LESNAYA PROMYSHLENNOST in Russian 10 Oct 85 p 2

[Article by P. Tizengauzen under the rubric "In the USSR Ministry of the Timber and Paper Industry": "To Increase the Responsibility of Everyone"]

[Text] The collegium of the USSR Ministry of the Timber and Paper Industry has reviewed progress made in carrying out plans for production and the introduction of new technology in September and during the first nine months of this year, as well as measures to ensure that plan goals and socialist obligations are met during 1985.

CPSU Central Committee section chief I. T. Rysev, responsible workers of the USSR Council of Ministers, USSR State Planning Commission and the trade union central committee, ministers and deputy ministers from the union republic, chiefs of all-union and production associations and association party committee secretaries took part in the work of the collegium.

The Chief of the Economic Planning Administration, A. Ya. Dirks, addressed the group. He noted that, despite improved work during the third quarter, the situation with regard to fulfilling this year's plan remains tense. Those who have fallen behind usually cite unfavorable weather conditions as the main reason. However, this has not prevented the Ukrainian, Belorussian and Estonian SSR ministries or the Karallesprom, Komilesprom, Tomlesprom, Tyumenlesprom, Irkutsklesprom, Lenles, Novgorodles and other associations from coping with the plan for timber haulage during the first three quarters.

In the cellulose and paper industry, the labor collectives of the Kotlass Cellulose and Paper Combine, the Syktyvkar Lumber Industry Combine, the Pitkyaranta Cellulose Plant and the Kaliningradbumprom and Gruzbumprom production associations continued to work persistently.

The enterprises of the Ministry fulfilled the 9-month plan for cultural and personal services products, newsprint, matches and furniture. Goals set for housing construction and for introducing new production capacity in the furniture industry were met.

At the same time, shortfalls permitted in the production of a majority of product types during the first quarter are slow in being made up and, for



some of them, deficiencies have increased during the second and third quarters. Thus, during the nine month period, timber haulage output fell short of the plan by 1.4 million cubic meters, production of lumber--by 12.3 million cubic meters, milled products--by 2.6 million cubic meters, and wooden homes--by 105,000 square meters. The plan for product sales was not met. The Glavvostlesprom, Glavstandartdom, Soyuzlesdrevprom, Soyuzfanspichprom, and Soyuzbumizdeliya production associations, the Ust-Ilim and Bratsk timber industry combines and the Lithuanian SSR Ministry of the Furniture and Wood Processing Industry allowed the greatest shortfalls. Prime cost overexpenditures for commodity production amounted to 67.6 million rubles. The plan for contract deliveries also was not fulfilled.

I. T. Rysev noted in his speech that the qualitative reorganization of work to which the CPSU Central Committee Plenum turned its attention still has not become evident in the Branch. The Party has set a task--that the annual plan must be fulfilled, and without any correctives. Party and economic managers must now concentrate their efforts on ensuring that every brigade, shop and enterprise meets plan goals. Rather than explaining the reasons for deficiencies, it is necessary to correct the situation.

First Deputy Minister G. L. Medvedev pointed to the necessity of improving the work of year-round access roads. At present, both railroads and reinforced concrete highways are operating at only half capacity. Timber-splitting has also fallen behind. The shortfall in crosscutting exceeded 4 million cubic meters. As a result of low stockpiles, we are experiencing an acute shortage of wood ready for processing.

Summarizing the results of the collegium's work, Minister M. I. Busygin focused the attention of those present on the need to intensify work with the collectives. The "give, give" method cannot produce success. Daily, painstaking work is needed. However, it is necessary not only to increase demands but also to provide assistance to sectors which are lagging behind. To go to every working place and to point the working collectives in the direction of meeting set goals--this is our task.

It is important now to complete preparations for the winter season in a timely way, to intensify the work of all units, to increase productivity and technological discipline and constantly to look for reserves. From the first days of the winter working period, we should be working according to the January plan. The plan for the 4th quarter is complicated, but realistic. The enterprises of the Branch have everything needed to fulfill it. All-out effort by every brigade, shop and sector--this is the guarantee that established goals will be met. Party, trade union and economic managers must raise the banner of socialist competition even higher and must greet the 27th CPSU Congress with significant labor achievements.

An appropriate resolution was adopted concerning the questions which were discussed.

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## FORESTRY AND TIMBER

### IZVESTIYA ON TIMBER PROCUREMENT, USE PROBLEMS

Moscow IZVESTIYA in Russian 11 Dec 85 p 1

[Editorial: "Utilizing the Forest Economically"]

[Text] The timber industry is supplying more and more lumber, cellulose, paper and other products which the national economy requires. Many enterprises of this industrial sector are successfully completing the year and five-year plan in its entirety. The "Basic Directions" draft has assigned this sector the task of improving utilization of timber raw material resources, primarily by means of multi-purpose processing of raw material and reforestation. Leading enterprises are striving to carry this out. Among them are lumbering companies of a series of oblasts of the Ukraine, Belorussia and unions of "Karellesprom," "Komilesprom" and several others. Leaders of the nation's wood-paper industry are working steadily--the Kotlasskiy Pulp and Paper Complex, and the Syktyvkarskiy Timber Industry Complex.

However, on the whole this sector has not yet reached a growth rate which would guarantee fulfillment of the yearly quota. The plan for lumber and paper production has not been completed. Timber logging is short of the plan by more than 1.5 million cubic meters; marketable lumber by 13.2 million cubic meters; and sawn lumber by 3 million cubic meters. This sector has also not completely fulfilled its production quota. The greatest lag has been permitted by collective staffs of Glavzaplesprom, Glavvostlesprom and "Soyuzlesdrevprom."

All the same, this sector worries little about effectively utilizing timber resources. It is known that, unlike mineral resources, the forest is a constantly regenerative raw material source. It is possible that this factor has caused some workers to have only a carefree, consumer attitude toward these resources. But the problem is to learn to responsibly and prudently regulate our nation's timber resources. Materials of the April and October (1985) CPSU Central Committee Plenum, the draft of "Basic Directions of Economic and Social Development of the USSR for 1986-1990 and for the period to 2000" are aimed at such an approach against wastefulness and losses.

To utilize timber economically, it is necessary to conduct all stages of its production and application in the best way, to process raw material fully and to incorporate necessary technology everywhere. It is necessary to introduce

wood substitutes more actively and when preparing lumber, particularly wood chip board, to more fully use low-grade raw material and waste products which are still considered worthless in many places.

This sector has also had experience in zealous management. More than 6 million cubic meters of timber are procured yearly, for example, in the "Timlesprom" association. Previously, a sixth of the raw material was wasted here. But the association's enterprises have sought ways to get involved in processing wood waste, which they are now processing on the spot, producing quite a bit of varied production. They are modernizing capacities of wood-sawing, packing production and reconstruction of two crosstie factories, and constructing new packing shops.

However, there are not many of these examples. The timber potential of Siberia and the Far East is exploited uneconomically. One cubic meter of wood procured in Siberia yields half as much finished production as in the country as a whole. There is much waste from the forest as well as raw material for crossties. Millions of cubic meters of procured timber await a consumer for years, are not taken from the forest and rot on land plots, in inferior warehouses and at railroad stations. Thus, 800,000 cubic meters of lumber have accumulated in warehouses of the "Arkhangelsklesprom" association, 1.5 million cubic meters of this raw material await trains in "Komilesprom" and nearly 1.5 million crosstie pieces are in Krasnoyarsk Kray warehouses. The "Tyumenlesprom" association is not able to dispatch more than half a million cubic meters of timber to consumers because railway men have been deficient in delivery of 10,000 cars since the beginning of the year. And for three quarters of this year, consumers across the country have not received over 400,000 cars of timber. Paper production transport is delayed.

Workers of Soyuzglavles, Gossnab and Gosplan USSR have been called upon, along with transporters, to radically revise this problem. It is intolerable to lose not only the timber, but the labor of thousands of people who have procured it.

A prudent attitude toward the forest is a concern of all the people. But facts reported by readers of PRAVDA indicate that not everyone has taken this concern to heart. Forester A. Piskunov of Sverdlovsk Oblast writes that in laying a power line, woodcutters of the trust "Uralenergostroy" wasted many hectares of valuable timber, which remained there to rot on the ground. This is not an isolated fact. When laying electrical transmission lines, the Gornopravdinsk-KhantyMansiysk organizations of the USSR Minenergo cut down nearly 100,000 cubic meters of timber and put only a small portion to use. Many hectares of taiga are to be cut down for the line of a new Amuro-Yakutsk railroad main under construction, but it is still not clear how this timber will be used.

Continual concern about the timber resources of our nation, their rational complex utilization and the incorporation of necessary technology must be in the minds of party, trade union and Komsomol organizations and local soviets. It is necessary to raise personal responsibility of each economic manager for this important work and to strictly require those who allow waste to more broadly

develop socialist competition for economy and thrift and to continually inspire a feeling of production economy in people.

Efforts of party, soviet and economic leaders must be concentrated on fulfilling annual plan quotas of each brigade, shop and enterprise and on clear-cut work organization under winter conditions. Let discipline and daily concern for people--their work, life, rest--be the rule for all collective staffs.

To learn to manage the forest economically and rationally and to obtain more finished production with less expenditure means to actively realize tasks promoted by the party for accelerating social-economic development of the country.

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## FORESTRY AND TIMBER

### TIMBER INDUSTRY NEED FOR WASTE WOOD PROCESSING EQUIPMENT

Moscow EKONOMICHESKAYA GAZETA in Russian No 50, Dec 85 p 9

[Article by V. Sokikas, Director of Ikkutsk Branch of Central Scientific-Research Institute of Mechanization and Energy of the Timber Industry  
"Waste-Free Lumbering"]

[Text] All raw material processed in one association.

What remains in the felling area?

Mobile manipulator pneumatic-powered equipment needed.

The output of the timber, woodworking and pulp-and-paper industry made up over 20 percent of the overall production volume in the Irkutsk Oblast. Scores of enterprises are engaged in logging and processing timber. The production of pulp, cardboard and wood particleboard is expending at a breakneck pace, at twice the rate at which timber hauling is increasing. The existing large yeast-hydrolysis plants are being expanded and new ones are being built in Bratsk and Ust-Ilimsk. Low-quality timber and secondary raw materials are even now being used to manufacture hundreds of millions of rubles worth of products that the national economy needs. This is a result of the ongoing intensive labor at enterprises in the oblast.

Until recently, only about 330,000 cubic meters of lumber had been produced from 610,000 cubic meters of timber in the Kitoyles production association. The remainder - sawdust, scraps, slabs of wood - was either used for fuel or went straight to the dump.

It is possible to increase useful timber yield by more thoroughly classifying the raw material before sawing it. This simultaneously cuts waste in sawmilling and timber processing shops is decreased and ensures further processing. A barking shop with a log pond was built at a timber transshipment base, which made it possible to deliver clear timber for sawing. Larch bark is supplied to the Tarutinskiy plant as the raw material for tanning.

Machines for cutting and classifying timber have been installed in sawmilling shops. All pieces of timber waste and scraps are now transformed into industrial chips. A special shop was then fitted out, in which approximately



100,000 cubic meters of specially-made chips is produced annually. They also started to use sawdust, of which up to 60,000 cubic meters are delivered to hydrolysis plants every year. About 900,000 cubic meters of timber were economized solely because of recycling waste.

The introduction of waste-free processing methods at a felling area is a very important and complex problem. A great deal of attention is being paid to solving this problem everywhere.

Work at the Ust-Ilimskiy timber industry complex, a production association, is oriented towards the overall processing of raw material. Many plants operate within this complex. There are a pulp plant, a plant for preparing and processing the raw timber, and two machinery plants for repairing equipment of the industrial area and logging enterprises. Also located here are 11 timber forms, a timber chemistry establishment, the Ilimskoye timber transshipment enterprise, which has a machinery park at its disposal, as well as ancillary services and sections.

The grounds of the Timber Industry Complex - the felling area - measure 280 km from south to north and 240 km from west to east. The total area of forest resources encompasses almost three and a half million hectares. The area of operation encompasses approximately two million hectares.

As envisaged by the plan, a low-waste processing method for logging has been introduced at the complex. The felling debris which results from cross-cutting long logs and sawmilling is processed into industrial chips that are used to manufacture pulp. A powerful yeast-hydrolysis plant and a large wood particle-board shop are being put into operation. Timber waste will also be used as the raw material for both the plant and the shop.

However, a large amount - up to 200,000 cubic meters of the planned volume of logging - of so-called timber scraps accumulates in the felling area in the process of felling, skidding and loading tree-length logs. The waste which results from felling trees is in the form of large branches, tree tops and substandard timber having a stem diameter of less than 12 cm. This amounts to another 600,000 or so cubic meters. Coniferous needle-bearing twigs also remain in the forest, nor are small and medium size branches used.

Calculations show that processing this raw material can yield an additional 40 tons of pulp, 30,000 cubic meters of lumber, 50,000 cubic meters of wood particleboard, 10 tons of fir oil, and 1,500 tons of vitamin flour from conifer needles. Another advantage which results from this is to prolong the life of the felling area.

Making use of all this waste while at the same time creating optimum conditions in the felling areas for regenerating the forest may be done using mobile manipulator pneumatic-powered equipment. There is a need for portable felling machines which are capable of processing waste of any diameter from timber into chips. Also needed are machines for transporting the chips, machines to prepare coniferous forage from branches, and machines which are capable of loading up scraps of waste from logging.

Loggers are creating this equipment unaided. The first steps were taken in the association last year, for example, when manipulators were installed in MAZ-500 motor vehicles. They were used at a number of timber farms to collect over 40,000 cubic meters of short pulpwood and transport it to the complex for producing pulp. Fifty thousand cubic meters of logging debris were stocked and used as a substitute for firewood. Almost 450 hectares of forest were spared from felling in one year alone thanks to this method.

The TsLS-98 machine was designed and built at the Irkutsk Branch of the Central Scientific Research Planning and Design Institute of Mechanization and Power engineering of the Timber Industry. This machine is for collecting broken ends which remain in the felling area and cross-cutting them into logs. Two such machines are already operating at the Shirokopadskiy timber farm in combination with container-transport machines, which are mounted on the KrAZ motor vehicle and are used to haul pulpwood. This makes it possible to increase the productivity of each hectare by an average of seven cubic meters.

The experimental machinery plant of our branch has the capacity to produce several TsLS-98 machine units annually, while at least 100 of them are needed. The existing production capacities of the plant are not large enough to manufacture this number of machines, however.

We need the assistance of machine builders. The "Lesdrevmash-84" exhibition presented many interesting and necessary pieces of equipment, some manufactured domestically. This equipment has not found its way to the felling area as of yet, however. We would like to hope that machine builders will consider the needs of loggers and help in incorporating waste-free technology in the Twelfth Five-Year Plan. After all, economizing timber resources is not only important, but concerns us all.

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## FORESTRY AND TIMBER

### BRATSK INDUSTRIAL WASTE DAMAGES FORESTED REGION

Moscow LESNAYA PROMYSHLENNOST in Russian 5 Oct 85 p 2

[Article by LESNAYA PROMYSHLENNOST correspondent I. Pokrovskaya: "Preserve Rather than Restore; Commentary by the Board of the USSR Department of Forestry"]

[Text] In the area around Bratsk, industrial waste is ruining the forests. They are withering away within a 40-kilometer radius from the city, and 80 kilometers away, damage to the crowns of the trees is evident. The Bratsk Aluminum Plant under the USSR Ministry of Ferrous Metals is primarily responsible for the pollution in the air. Its accomplices are the local timber combine of the USSR Ministry of Wood and Paper Industries and the two powerful heat and electric power stations of the USSR Ministry of Power Engineering and Electrification.

As early as 1976, plans were made to install the first industrial system for trapping the ventilation (lighting) emissions. In 1980, work was to begin on the rest of the scrubbing systems, the plant's pollution buffer zone was to be completed, and the residents of the settlement of Chekanovskiy were to be relocated outside of the zone's boundaries. It is a great misfortune that these plans remain written monuments to good intentions.

The Bratsk Forestry Association, which exists to improve the condition of the plant's natural surroundings, is continually conducting both solid and selective cutting of timber stands in the polluted zone. In some of the clearings, hardwood seedlings are preserved, and in the rest of the clearings, the hardwoods are allowed to become dominant because they are three to five times hardier than the coniferous species. As an experiment, foresters planted 431.5 hectares with deciduous and hardwood trees for purposes of observation.

To compensate for the damage, the State Arbitration Committee exacted 2.07 million rubles from the aluminum plant in 1982 and awarded it to the State Budget, and the plant's chief engineer and chief mechanic were fined. Recently, it was decided to fine the plant an additional 5 million rubles.

However, the condition of the plantings in the region of the Bratsk Aluminum Plant is still a sore point. Foresters are unable to fell all of the unhealthy trees. Because of the slopes of the Dolgiy mountain range have a

35 to 45 degree angle of incline, 800,000 cubic meters of dry standing timber have not been cleared. The hardwoods with which the foresters were hoping to restore the dying forests are also perishing (38 percent), while the rest are only living 15 to 25 years. The special test plantings are also being harmed.

That is why the problem of industrial emissions in the Bratsk region once again became a priority at the regular meeting of the USSR Department of Forestry collegium. All interested parties attended and made presentations. The list of those invited omitted perhaps the most important representative -- the RSFSR Minister of Health. Obviously, the meeting did not take place just for the sake of the forest. It was clear to everyone that clean air and land, commercially useful timber, and everything else that can be supplied by a healthy forest concerned everyone primarily from the standpoint of obtaining the maximum return for the nation.

Although the representative of the USSR Ministry of Ferrous Metals justifiably admonished the science of forestry for not providing before now standards for maximum permissible concentrations for flora, what is now relevant is that it is pointless to reconstitute the forests close to the Bratsk Aluminum Plant as long as the air is polluted. It is for precisely this reason that the RSFSR Ministry of Forestry did not agree to construct a pollution buffer zone around the plant. The project would cost the plant 6 million rubles and, as the board made clear, this would not guarantee an improvement in the condition of the surrounding territory. Is it worth spending so much money on something that we know will be fraught with problems? Would it not be better to invest these millions in a solution to the basic problem, which is the construction of a scrubbing system that would at the very least reduce by several times the emission of harmful substances into the atmosphere?

In the meantime, a strange paradox is taking shape: The USSR Ministry of Ferrous Metals is destroying the forest with toxic emissions, while the forestry department is spending a lot of time on all kinds of agreements, investing resources, and, if that were not enough, not assigning sufficient manpower to put out this "fire." In other words, the problem is being dumped on whoever happens to be around. This was also brought up by the board. The foresters provided as an example the hangar enterprises, which, until recently, were the source of a lot of trouble until they were given the responsibility of maintaining the forests in their areas. When these enterprises began to repair the damage themselves, they became serious about looking after the newly established forests.

The board also noted that, up to now, the forestry organizations have not paid sufficient heed to the effects of the industrial emissions from the Bratsk Timber Combine (USSR Ministry of Wood and Paper Industries) and the two heat and electric power stations run by the USSR Ministry of Power Engineering and Electrification.

Once again, the Board of the USSR Department of Forestry expressed its concern for the protection of natural resources.

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